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PURE PENICILLIN IN OPHTHALMOLOGY

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Until recent months supplies of penicillin in current use contained some 80 to 90% of impurities. In contrast most of the samples now generally obtainable contain a concentration of penicillin of up to 80%, and limited quantities of pure penicillin are becoming available.

Pure penicillin in calcium or sodium salt is a white crystalline substance devoid of any yellowish tinge. It is freely soluble and is more stable than commercial (impure) penicillin. In the dry form pure penicillin remains stable when kept at room temperature over a period of many months. Aqueous solutions remain active for fourteen days when kept at room temperature under sterile conditions, and retain full potency for up to four weeks when kept on ice. One milligramme of pure penicillin corresponds to 1,660 Oxford units.

The use of penicillin in ophthalmology, and particularly in intraocular infections, is still limited by considerable difficulties. In the first place, penicillin administered systemically in the usual clinical doses does not penetrate into the interior of the eye. Secondly, commercial penicillin instilled locally into the conjunctival sac in high concentrations is not well tolerated; there are discomfort, conjunctival hyperaemia, and, in extreme cases, damage to the corneal epithelium; moreover, with tolerated concentrations there is no penetration through the cornea into the interior of the eye. To overcome the obstacles to the passage of the drug into the interior of the eye, penicillin has been employed as subconjunctival and intravitreal injections, and iontophoresis of solution instilled into the conjunctival sac has been practised, but only with indifferent results. The limit of tolerance to subconjunctival injections, though varying with different samples of commercial penicillin, is about 600 to 2,000 units in 0.5 ml. of water. With such doses the intraocular concentrations of penicillin are again low (only a trace in the aqueous, according to Struble and Bellows (1944), who employed 2,500 units in the dog; though, in man, Rycroft (1945) obtained higher values by the use of 4,000 units subconjunctivally—0 to 3 units per ml. in five instances, and 10, 15, and 20 units in three more). Intravitreal injection of commercial penicillin is badly borne by the experimental animal (v. Sallmann, Meyer, and Di Grandi, 1944; Sorsby, 1945; Mann, 1946), and this procedure has distinct clinical disadvantages. Iontophoresis as advocated by v. Sallmann and Meyer (1944) also presents clinical difficulties, and is only doubtfully valid on theoretical grounds (Hamilton-Paterson, 1946). Since the value of penicillin as a local therapeutic agent is limited by the inability of the eye to support large doses of the commercial product, and since intolerance varies directly with the amount of impurity present, a study of tolerance of the eye to pure penicillin was undertaken, followed by preliminary investigations of the levels of concentration that can be reached intraocularly and of the effect of local medication on experimental intraocular infections. These results have been assessed against those obtained both experimentally by the systemic administration of massive doses of commercial penicillin and clinically by the use of pure penicillin locally.

Experimental Studies on Pure Penicillin

Rabbits were used throughout. Guinea-pigs were also used at first, but proved unsatisfactory, particularly when intraocular fluids had to be collected, and were therefore discarded. The rabbits were of a mixed breed and generally six months old, with an average weight of 1,500 g. The concentration of penicillin in the eye fluids, blood, and tissue extracts was estimated by the standard capillary tube method, as described by Fleming. Where ointment was introduced into the conjunctival sac, 0.1 ml. (=0.1 g.) was delivered into the lower fornix from a syringe with a wide-bore needle, and spread evenly over the globe through the closed lids; before aqueous was withdrawn for assessing the concentration of penicillin the conjunctival sac was thoroughly irrigated. Where penicillin was injected into the vitreous, the needle was entered at the equator of the proptosed eye and the drug injected centrally; a similar technique was used for introducing infection into the vitreous. Subconjunctival injections were made by the usual clinical method, and fluid from the aqueous was collected by limbal puncture (subconjunctivally), also in the proptosed eye. In assessing the concentration of penicillin in solid tissues, the parts were minced with scissors on a watch-glass, placed in 1 ml. of saline (2 ml. in the case of the sclerotic), and allowed to stand overnight in a refrigerator; the supernatant fluid was then tested

Tolerance

Pure penicillin in aqueous solution in concentrations of 10,000, 25,000, 50,000, and 100,000 units/ml. was well tolerated when two or three drops were instilled into the conjunctival sac at ten intervals of three minutes. There was no obvious irritability, nor any flushing of the eye. Likewise pure penicillin in ointment form was well borne in concentrations of 500, 1,000, 2,000, 4,000, 8,000, 25,000, 50,000, and 100,000 units per gramme. The ointment was made up in two different bases, one being "eucerin" L.M. base, and the other a specially prepared mixture of petroleum jelly and liquid paraffin (90 and 10 parts of each respectively). Some ointment still remained in the conjunctival sac after half an hour. Subconjunctival injections of 0.5 ml. of water containing 25,000 and 50,000 units of pure penicillin were also well tolerated. There was no reaction around the bleb produced by the injection, and the bleb had mostly disappeared within three to four hours. The vitreous too tolerated direct injection of pure penicillin: 0.1 ml. of saline containing 5,000 units (50,000 units/ml.) and 0.2 ml. containing 10,000 units produced a visible "globule" in the vitreous, with but little reaction around it and no ophthalmoscopically visible changes. Apart

from some scattering of the globule after six months (the total period of observation) there was practically no reaction of the vitreous or the globe as a whole.

These observations suggested that, in contrast to commercial penicillin, the pure product is remarkably well tolerated by the eye, so that ocular intolerance is not a factor of any significance in limiting its use. It should, however, be borne in mind that concentrated solutions of pure penicillin should be made up in water rather than saline; watery solutions containing 20,000 to 50,000 units of pure penicillin per ml. are isotonic with 0.9% sodium chloride, while saline solutions of such concentration are distinctly hypertonic (Ungar and Denston, 1946).

Concentration in Interior of Eye

In the Primary Aqueous (Chart I).—The level of penicillin in the aqueous obtained at different time intervals (*a*) after a single instillation of penicillin ointment in the conjunctival sac, and (*b*) after subconjunctival injection, was determined.

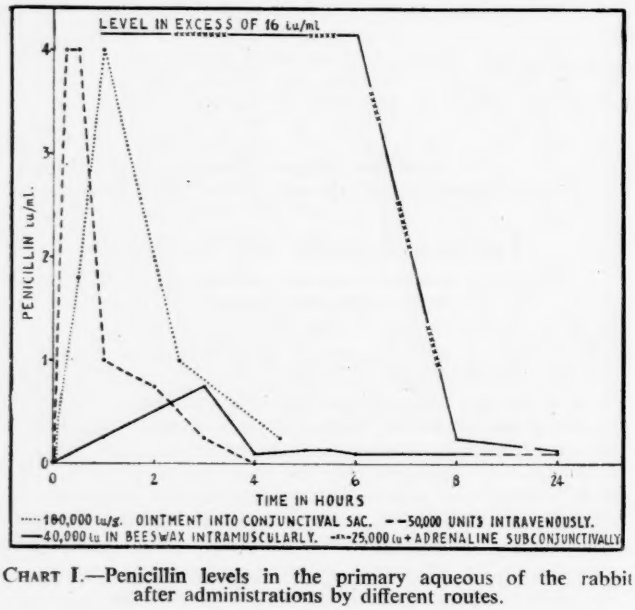

CHART I.—Penicillin levels in the primary aqueous of the rabbit after administrations by different routes.

(*a*) For instillation of pure penicillin ointment the base used was a mixture of petroleum jelly and liquid paraffin, as already indicated. Table I shows that penicillin penetrates in therapeutic levels through the cornea when ointments of high concentrations are used. Each reading in the table represents

TABLE I.—*Level of Penicillin (Units/ml.) in Primary Aqueous on Instillation of 0.1 g. of Concentrated Ointments of Pure Penicillin into Conjunctival Sac*

Concentration (units/g.)	At 1/2 hr.	At 1 hr.	At 2 hrs.	At 2½ hrs	At 3 hrs	At 4 hrs	At 4½ h.s.	At 22 hrs.
25,000	4, 4	1·5, 2, 2		0·125, 0·25, 0·25	0		0, 0	
50,000	8, 8	1·5, 2, 2, 3, 3, 4	1·5, 4	0·125, 0·125	0, 0, 0	0, 0	0, 0	0
100,000	2, 2	4, 4, 8		1, 1			0·25, 0·25	0

a single estimate, and the 44 readings recorded all refer to primary aqueous. These findings suggest that the more concentrated the ointment the higher is the concentration of penicillin in the aqueous, and that a therapeutic level is sustained for 2½ hours and possibly longer.

(*b*) The level of penicillin in the primary aqueous was also determined at different time intervals after the injection subconjunctivally of 25,000 units of pure penicillin in 0.5 ml. of water. As can be seen from the first column in Table II, adequate levels are quickly reached in the aqueous and maintained for at least 6 hours, and possibly longer. That the levels of penicillin reached and maintained by this procedure are the result of the quantity injected and not conditioned by the purity of the agent is shown by the findings recorded in the second column of the table, where it is seen that the distinctly irritating commercial penicillin gives concentrations somewhat similar to those of pure penicillin. The results in the last column suggest that when adrenaline is added to pure penicillin considerably higher levels are reached in the aqueous. (The penicillin was dissolved in 0.25 ml. of water to which 0.25 ml. of adrenaline 1:1,000 was added.)

That at least some of the penicillin in the aqueous reaches it through the blood stream rather than directly by penetrating

TABLE II.—*Levels in Primary Aqueous of Anterior Chamber after Subconjunctival Injection of 25,000 Units of Penicillin*

	Pure Penicillin	Commercial Penicillin (654–1,425 u/ml.)	Pure Penicillin with Adrenaline
	Units/ml.	Units/ml.	Units/ml.
At 15 minutes ..	2	16	
,, 30 ,, ..	16	16	
,, 1 hour ..			>16, 16
,, 1½ hour ..	10, 16	1, 4	
,, 2 ,, ..	4, 32	4	>16, 12
,, 2½ ,, ..	2, 4	1, 8	
,, 3 ,, ..	0·5, 2	2	
,, 4 ,, ..	4	4	6
,, 5 ,, ..	1, 1	0·25	
,, 6 ,, ..	0·5	1	>16, 0
,, 8 ,, ..			0·25
,, 15 ,, ..			0
,, 22 ,, ..			0·125
,, 24 ,, ..	0·5 (0, 0, 0·12, 0·06*)		

* Secondary aqueous.

the corneo-scleral angle is suggested by the findings recorded in Table III. When only one eye received a subconjunctival

TABLE III.—*Level of Penicillin in Primary Aqueous of Anterior Chamber after Subconjunctival Injection of 25,000 Units in Opposite Eye*

	Units/ml.
At 2 hours ..	4*
,, 3 ,, ..	0·25
,, 5 ,, ..	0·125

* The injected eye showed the value of 32 units at 2 hours.

injection of 25,000 units of penicillin a not insignificant concentration was obtained in the aqueous of the opposite eye at 2, 3, and 5 hours. That most of the penicillin injected subconjunctivally is indeed absorbed into the blood stream is shown by the findings in Table IV, which also suggest that absorption into the blood stream is rapid and that excretion is, too. Aqueous levels seem to be maintained longer than blood levels. The rapid absorption into the blood stream may explain why unmedicated subconjunctival injections of penicillin are less effective than injections with adrenaline; presumably the adrenaline subconjunctivally impedes absorption into the blood stream.

TABLE IV.—*Level of Penicillin in Arterial Blood after Subconjunctival Injection*

	A	B	C
	Units/ml.	Units/ml.	Units/ml.
At 1 hour	2, 2, 2		
,, 2 hours	0·25		
,, 2½ ,, ...		2	
,, 3 ,, ...	0·125 (1*)	0	
,, 3½ ,, ...	0·06		
,, 4 ,, ...	Trace, 1		
,, 5 ,, ...	0, 0·25	0	
,, 6 ,, ...		0, 0	0, 0·5
,, 24	0	0	0

A.—In rabbits receiving 25,000 units pure penicillin subconjunctivally in one eye and 25,000 units commercial penicillin in the other—i.e., a total of 50,000 units. B.—In rabbits after 25,000 units pure penicillin subconjunctivally in one eye only. C.—In rabbits after 25,000 units pure penicillin with adrenaline subconjunctivally in one eye only.

* 25,000 units pure penicillin subconjunctivally in each eye with adrenaline.

Concentration in Other Ocular Tissues on Application of Ointment and on Subconjunctival Injection.—No systematic study was undertaken, but the results shown in Table V indicate that adequate therapeutic levels are present in the cornea, sclera, and vitreous as late as 5 hours after a subconjunctival injection, and suggest that equally satisfactory results can be achieved by the application of ointments

TABLE V.—*Levels of Penicillin reached in Ocular Tissues on Application of Ointment and on Subconjunctival Injection of Pure Penicillin*

Tissue†	Ointment, 50,000 Units/g.; 0·1 g. instilled				Subconjunctival Injection of 25,000 Units
	At 1 hr.	At 2 hrs.	At 3 hrs.*	At 4 hrs.	At 5 hrs.
	Units/ml.	Units/ml.	Units/ml.	Units/ml.	Units/ml.
Cornea ..	2	0·75	0	0·25	0·25, 0·25
Lens ..	0	0·1	0	0	0, 0
Sclera ..	2	1	0·25	0·25	4, 2
Vitreous ..	1	4	0·2	0·2	0·15
Uvea ..	4	0·3	0	0	Not determined

* Arterial blood at 3 hours showed no penicillin.
† An experimental error of 0·1 unit/ml. was shown by the presence of that amount of penicillin in washings from the eye after washing with 6 ml. saline 3 hours following application of ointment. (Before this estimate was carried out the eye had been washed in two changes of saline.)

Chart II). A copious flow of tears noted in one rabbit 4 hours after instilling ointment, 100,000 units per gramme, revealed a concentration of penicillin of more than 16 units per ml. of tears.

Concentration in Aqueous and Vitreous in Infected Eyes after Subconjunctival Injection.—In the course of therapeutic experiments, recorded below, the level of the aqueous and vitreous in infected and treated eyes was determined at 5 hours and 24 hours after subconjunctival injection of 20,000 units with adrenaline. As can be seen from the second column of Table XIV, the aqueous at both 5 and 24 hours contained more than 2 units of penicillin, while the vitreous contained 0·1 and 0.25 unit respectively. Column 1 of the same table suggests that without adrenaline the values are not dissimilar.

Local Therapy with Pure Penicillin in Intraocular Infections

Two types of experimental infection and two modes of treatment—(*a*) subconjunctival injections and (*b*) the application of ointment—were studied. The anterior chamber was infected in 24 eyes and the vitreous in 16. In no case were both the anterior chamber and the vitreous infected. Treatment was begun within two hours after infection.

Anterior Chamber Infection.—(*a*) Three eyes were infected with suspensions of *Str. haemolyticus* and one with *Staph. aureus*, the suspensions containing 25,000,000 organisms per ml.; 0.1 ml. was injected into the anterior chamber by subconjunctival puncture at the limbus. Treatment consisted of subconjunctival injection of 25,000 units of pure penicillin twice daily for two days. As can be seen from Table VI, the process was controlled, but not completely; in two eyes there was still slight exudate along the pupillary margin on the fifth day, while one eye showed a more severe reaction,

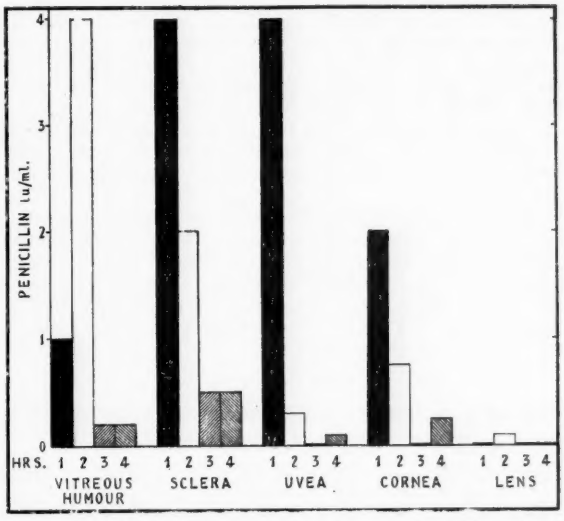

CHART II.—Penicillin levels in ocular tissues of rabbits after local application of ointment (50,000 units/g.).

and the fourth one a still heavier disturbance. These results were, however, better than the state of two untreated eyes, which were largely disorganized. Four further eyes infected less heavily with staphylococcus (1,000,000 organisms per ml.) and treated for a day longer did distinctly better. Only one eye showed exudate along the pupillary margin on the fifth day, while the remaining three were normal. Two untreated control eyes were disorganized by this time.

TABLE VI.—*Infections of Anterior Chamber: Treatment by Subconjunctival Injections and by Ointment*

No.	Organism	Concentration of Infecting Fluid (Dose: 0·1 ml.)	Treatment	End-result (on 5th Day)	Remarks
			Subconjunctival Injection		
1	Staph. aureus 663 ..	25,000,000/ml.	25,000 units twice daily for 2 days	Slight exudate in anterior chamber	5 control eyes ended in a destructive suppurative reaction
2	Str. haemolyt. 618 ..	,,	,,	Exudate in anterior chamber	
3	,, ,, ..	,,	,,	Slight exudate in anterior chamber	
4	,, ,, ..	,,	,,	Considerable exudate in anterior chamber	
5	Staph. aureus 663 ..	1,000,000/ml.	20,000 units with adrenaline twice daily for 3 days	Eye normal	
6	,, ,, ..	,,	,,	Slight exudate in anterior chamber	
7	,, ,, ..	,,	20,000 units twice daily for 3 days	Eye normal	
8	,, ,, ..	,,	,,	,,	
			Ointment—0·1 g. three times a day for 3 days:		
9	,, ,, ..	,,	25,000 units/g.	,,	
10	,, ,, ..	,,	,,	,,	
11	,, ,, ..	,,	50,000 units/g.	,,	
12	,, ,, ..	,,	,,	,,	
13	,, ,, ..	,,	100,000 units/g.	Slight exudate in anterior chamber	
14	,, ,, ..	,,	,,	,,	

TABLE VII.—*Infections of the Vitreous: Treatment by Subconjunctival Injections and by Ointment*

No.	Organism	Concentration of Infecting Fluid (Dose: 0·1 ml.)	Treatment	End-result (on 5th Day)	Remarks
			Subconjunctival Injection		
1	Staph. aureus 663 ..	1,000,000/ml.	20,000 units twice daily for 3 days	Eye normal	4 control eyes all ended in a destructive suppurative reaction
2	,, ,, ..	,,	,,	,,	
3	,, ,, ..	,,	20,000 units with adrenaline twice daily for 3 days	,,	
4	,, ,, ..	,,	,,	,,	
5	,, ,, ..	10,000,000/ml.	20,000 units twice daily for 3 days	,,	The 10 eyes treated with subconjunctival injections were all outwardly normal, but Nos. 5, 6, 8, 9, and 10 showed some vitreous opacities
6	,, ,, ..	,,	,,	,,	
7	,, ,, ..	,,	,,	,,	
8	,, ,, ..	,,	,,	,,	
9	,, ,, ..	,,	,,	,,	
10	,, ,, ..	,,	,,	,,	
			Ointment—0·1 g. three times a day for 3 days:		
11	,, ,, ..	,,	25,000 units/g.	Eye quiet but extensive vitreous organization	The 6 eyes treated with ointment showed vitreous organization, visible to the naked eye as a grey mass
12	,, ,, ..	,,	,,	,,	
13	,, ,, ..	,,	50,000 units/g.	,,	
14	,, ,, ..	,,	,,	,,	
15	,, ,, ..	,,	100,000 units/g.	,,	One control eye ended in a destructive inflammatory reaction
16	,, ,, ..	,,	,,	,,	

(*b*) Ointment (petroleum jelly and liquid paraffin base) was delivered into the conjunctival sac by a syringe three times daily for three days; the concentration of the ointment was 25,000 units/g. in two eyes, 50,000 in two more, and 100,000 in yet another two. The type and degree of infection were the same as with the second series treated with subconjunctival injection (0.1 ml. of a suspension containing 1,000,000 *Staph. aureus* per ml.), and the results were substantially the same. Five of the six eyes were normal on the fifth day, and one showed a slight exudate at the pupil margin. An untreated control eye was lost.

Vitreous Infection.—(*a*) Ten eyes were infected with *Staph. aureus* injected centrally into the vitreous by direct puncture at the equator: 0.1 ml. was injected in all cases, the concentration of the infecting fluid being 1,000,000 organisms per ml. in four eyes and 10,000,000 per ml. in the remaining six. Treatment was given twice daily for three days, and, as can be seen from Table VII, the results were remarkably good. Residual vitreous opacities were observed ophthalmoscopically in five of the ten eyes. The four control eyes were all lost.

(*b*) Six eyes were infected as for subconjunctival therapy, the concentration of the infecting fluid being 1,000,000 *Staph. aureus* per ml. Two eyes were treated with ointment 25,000 units/g. three times daily for three days, two with 50,000 units/g., and two more with 100,000 units. There was no evidence of active inflammation on the fifth day, but the vitreous was largely an organized grey mass. An untreated control eye was lost.

Comparative Experimental Studies on Massive Systemic Administration of Commercial Penicillin

Struble and Bellows (1944) have indicated that a concentration of 1 unit of penicillin per ml. of aqueous can be obtained if 12,800 units per kilo body weight are injected intravenously in the dog—a dose of the order of about 40 times that of the usual clinical dose in man. Town and Hunt (1946) and Town, Frisbe, and Wisda (1946) have extended these observations, and have shown that anterior-chamber infection in the rabbit can be controlled by injections of 5,000 units per kilo body weight intramuscularly at 3-hourly intervals. In confirming and extending these findings an attempt was made to assess the relative value of systemic and subconjunctival administration of penicillin. Commercial penicillin was used for systemic injections.

Concentration in Interior of Eye

In the Primary Aqueous (Chart I).—The level of penicillin in the primary aqueous was determined at different time intervals from 1/4 to 6 hours on intramuscular and intravenous injection of 25,000 and 50,000 units into rabbits. As can be seen from Table VIII an adequate therapeutic level can be reached in the aqueous by systemic injections of both 50,000 and 25,000 units, but it does not persist for longer than 3 hours. This is a shorter period than that obtained by subconjunctival injection—and incidentally at a lower level, too. In attempts to raise the aqueous level and to increase its duration several modifications of intramuscular injection were tried. The detailed results are given in Table IX.

When an equal quantity of adrenaline 1:1,000 was added to the solution of penicillin (of which 40,000 units were injected) no marked increase in level or persistence was obtained; nor were better results achieved with penicillin to which had been added hexamine (7%) in the hope that this might cause a more ready passage of penicillin into the aqueous. The results were likewise negative when adrenaline (0.5 ml. of 1:1,000) was injected subconjunctivally at the time the intramuscular injection was given. Better results were recorded when penicillin was given intramuscularly in beeswax. The eighteen readings obtained with this mode of administration suggest that low aqueous levels are reached and maintained for at least 6 hours. None the less it is clear from a comparison of Table II with Tables VIII and IX that when approximately equal quantities are injected the subconjunctival route gives higher and more sustained aqueous levels of penicillin. That aqueous levels reached by the injection of penicillin intramuscularly and intravenously are unlikely to be maintained after 3 hours or so is indicated by the level reached in the arterial blood by these methods of administration, and by all the modifications indicated except that in which beeswax was employed (Tables X and XI). With penicillin intramuscularly or intravenously the blood level is low within 2 hours, and this was substantially uninfluenced by all modifications except beeswax. With penicillin in beeswax injected intramuscularly a high arterial level was still present at 6 hours, and at 22 hours the two of the three readings obtained were still significantly high.

Concentration in Other Ocular Tissues (Chart III).—The level of penicillin in various ocular tissues was determined in one case 30 minutes after the intravenous injection of 50,000 units and in a second case 2½ hours after an intravenous injection of 25,000 units (Table XII). These determinations indicate that penicillin administered in massive doses reaches in therapeutic levels all the tissues of the globe, the lens excepted.

Concentration in the Vitreous after Modified Intramuscular Injections.—As with the aqueous and arterial blood levels, there is nothing in the few findings available to suggest that any modification substantially affects the level of concentration

TABLE VIII.—*Aqueous Levels on Massive Systemic Administration of Penicillin*

	Intramuscular Injection		Intravenous Injection	
	25,000 Units	50,000 Units	25,000 Units	50,000 Units
	Units/ml.	Units/ml.	Units/ml.	Units/ml.
At 15 minutes ..	8	8	8	4
,, 30 ,, ..	1	4	8	4
,, 1 hour ..		2	1	1
,, 2 hours ..	0·5	1	0·25, 0·5	1, 4
,, 3 ,, ..		0·125	0·125	1
,, 4 ,, ..		0	0·1	0
,, 6 ,, ..		0	0	0

TABLE IX.—*Aqueous Levels on Modified Forms of Intramuscular Injections of Penicillin (40,000 Units)*

	Penicillin with Adrenaline	Penicillin with Hexamine	Penicillin in Beeswax	Penicillin Intramuscularly with Adrenaline Subconjunctivally
	Units/ml.	Units/ml.	Units/ml.	Units/ml.
At 1 hour	0, 2		0, 0·25, 0·25, 0·25	
,, 1½ hours	0·125			1
,, 2 ,,	1		0, 0·25	
,, 2½ ,,		0·125, 0·25		0·5
,, 3 ,,	1		0·25, 0·5, 0·75	
,, 4 ,,			0·1, 0·3	
,, 5 ,,	0·15		0·125	
,, 5½ ,,			0·125	
,, 6 ,,	0	0, 0	0·1, 0·125	0, 0
,, 8 ,,			0, 0	
,, 22 ,,	0			
,, 24 ,,			(?) 0·1	

TABLE X.—*Levels of Penicillin in Arterial Blood on Massive Systemic Administration*

	Intramuscular Injection		Intravenous Injection	
	25,000 Units	50,000 Units	25,000 Units	50,000 Units
	Units/ml.	Units/ml.	Units/ml.	Units/ml.
At 15 minutes ..	>8		>8	8
,, 30 ,, ..	>8	>8	>8	8
,, 1½ hours ..	1	2	1	0·25
,, 2½ ,, ..	Trace		0·25	
,, 3 ,, ..		0·6	0	0·125, 0·25
,, 3½ ,, ..		0		
,, 6 ,, ..		0, 0·125		0

TABLE XI.—*Levels of Penicillin in Arterial Blood on Modified Forms of Intramuscular Injection (40,000 Units)*

	Penicillin with Adrenaline	Penicillin with Hexamine	Penicillin in Beeswax	Penicillin Intramuscularly with Adrenaline Subconjunctivally
	Units/ml.	Units/ml.	Units/ml.	Units/ml.
At 1 hour ..			4	
,, 1½ hours ..			8	
,, 2 ,, ..	2		2	
,, 2½ ,, ..		0·25		
,, 3 ,, ..	2	0·5	1·5, 2, >16	
,, 4 ,, ..			3	
,, 5 ,, ..			2	
,, 5½ ,, ..			>16	0
,, 6 ,, ..	0·5	0, 0	2, >16	
,, 6½ ,, ..	0·25			0
,, 8 ,, ..			0·5	
,, 22 ,, ..	0		0, 1, 4	0

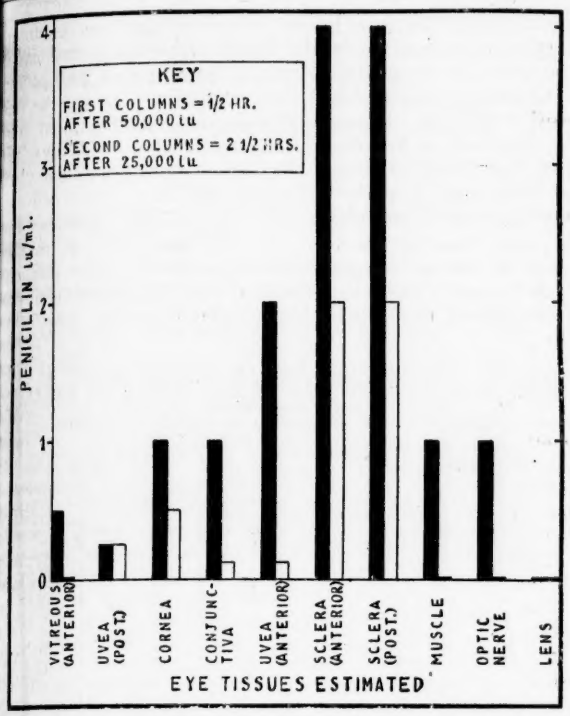

CHART III.—Showing distribution of penicillin in the tissues of the eyes of rabbits after intravenous injections of 50,000 and 25,000 units respectively.

TABLE XII.—*Levels of Penicillin reached in Ocular Tissues on Systemic Administration*

Tissue	30 minutes after 50,000 Units Intravenously	2½ hours after 25,000 Units Intravenously
Cornea	1	0·5
Lens	0	0
Anterior sclera ..	>4	2
Posterior ,, ..	>4	2
Anterior vitreous ..	0·125	0
Posterior ,, ..	0	4
Anterior uvea	2	0·125
Posterior ,, ...	0·25	0·25
Conjunctiva	1	0·125
Muscle	1	0
Optic nerve	1	0

the vitreous (Table XIII). Judging by the two readings recorded this would apply to beeswax–penicillin, too. (The one method that gave a high and sustained vitreous level was the injection of beeswax–penicillin subconjunctivally—a procedure that is clinically inapplicable, as it produces a severe reaction with gross corneal damage.)

Levels in the Aqueous and Vitreous of Infected Eyes.—As with subconjunctival penicillin, the level of the aqueous and vitreous of infected and treated eyes was determined at 5 hours and at 24 hours after intramuscular administration of 40,000 units in beeswax (Table XIV). The aqueous levels were low and the vitreous levels rather higher.

TABLE XIII.—*Levels of Penicillin reached in Vitreous on Systemic and Subconjunctival Administration*

Mode of Administration	At 1 hr.	At 2 hrs.	At 4 hrs.	At 22 hrs.	At 24 hrs.
	Units/ml.	Units/ml.	Units/ml.	Units/ml.	Units/ml.
40,000 units penicillin in beeswax intramuscularly	0·5			0	
40,000 units penicillin with adrenaline intramuscularly		0·25			
40,000 units penicillin intramuscularly with adrenaline subconjunctivally				0	
40,000 units penicillin in beeswax subconjunctivally in each eye		>2	1		0·25, 1

TABLE XIV.—*Random Estimates of Level of Penicillin in Aqueous, Vitreous, and Blood during Course of Treatment of Infected Animals*

Method of Treatment	Aqueous		Vitreous		Blood
	At 5 hrs.	At 24 hrs.	At 5 hrs.	At 24 hrs.	At 24 hrs.
	Units/ml.	Units/ml.	Units/ml.	Units/ml.	Units/ml.
Pure penicillin subconjunctivally (20,000 units)	1	0·5	0·15	0·5	
Pure penicillin with adrenaline subconjunctivally (20,000 units)	>2	>2	0·1	0·25	0
Penicillin in beeswax intramuscularly (40,000 units)	0·03	0·25	0·25	0·5	0·06, 1·125
Penicillin in beeswax (20,000 units subconjunctivally, with 40,000 units intramuscularly subsequently)		0·2		1·0	0·03

Treatment of Intraocular Infection by Intramuscular Injections of Massive Doses

Anterior Chamber Infection.—Two eyes were infected with *Str. haemolyticus* and two with *Staph. aureus*, 0.1 ml. of suspensions containing 25,000,000 organisms per ml. being injected into the anterior chamber, as in the experiments with subconjunctival penicillin therapy. Treatment consisted of intramuscular injection of 50,000 units of commercial penicillin twice daily for two days. As can be seen from Table XV, only one of these eyes became

TABLE XV.—*Infections of Anterior Chamber: Treatment by Intramuscular Injection*

No.	Organism	Concentration of Infecting Fluid	Treatment	End-result (on 5th Day)	Remarks
	Str. haemolyt. 618 ..	25,000,000/ml.	50,000 units in water twice daily for 2 days	Much exudate in anterior chamber	4 control eyes ended in a destructive inflammatory reaction
	,, ,, ..	,,	,,	Panophthalmitis	
	Staph. aureus 663 ..	,,	,,	Slight exudate in anterior chamber	
	,, ,, ..	1,000,000/ml.	40,000 units in beeswax twice daily for 3 days	Eye normal	
	,, ,, ..	,,	,,	,,	
	,, ,, ..	,,	20,000 units in beeswax subconjunctivally twice on 1st day, and 40,000 units intramuscularly for 2 further days	Infection controlled but much irritability of eye	

TABLE XVI.—*Infections of Vitreous: Treatment by Intramuscular Injections*

No.	Organism	Concentration of Infecting Fluid	Treatment	End-result (on 5th Day)	Remarks
	Staph. aureus 663 ..	1,000,000/ml.	Penicillin in beeswax 40,000 units twice daily for 3 days	Eye quiet, but vitreous is largely an organized grey mass	4 control eyes all ended in a destructive inflammatory reaction
	,, ,, ..	,,	,,	,,	
	,, ,, ..	,,	,,	,,	
	,, ,, ..	,,	,,	,,	
	,, ,, ..	10,000,000/ml.	,,	Eye inflamed but vitreous organized	None of the 10 eyes treated could be regarded as having good function, though the inflammatory process was largely controlled
	,, ,, ..	,,	,,	As 5, but more marked	
	,, ,, ..	,,	,,	As 5	
	,, ,, ..	,,	,,	Eye quiet, but extensive vitreous organization	
	,, ,, ..	,,	,,	,,	
	,, ,, ..	,,	,,	,,	

completely normal by the fifth day ; in one eye there was minimal reaction, as shown by exudate along the free margin of the iris, while in another there was considerably more exudate. One eye showed the classical picture of panophthalmitis. The two untreated control eyes ended in a destructive suppurative reaction. Four further eyes infected less heavily with *Staph. aureus* (1,000,000 organisms per ml.) were treated in a modified manner, two being given 40,000 units in beeswax twice daily for three days, and two receiving 20,000 units in beeswax subconjunctivally twice on the first day, and 40,000 units in beeswax intramuscularly for two more days. These did distinctly better. The infection in the anterior chamber was completely controlled, but in the two eyes that received beeswax subconjunctivally there was much reaction from the beeswax. Two untreated control eyes were completely lost.

Vitreous Infection.—Ten eyes were infected with *Staph. aureus* by the same technique as used in the therapeutic experiments with penicillin subconjunctivally. Four eyes received 0.1 ml. of suspension containing 1,000,000 organisms per ml., while six eyes had a concentration of 10,000,000 organisms per ml. Treatment consisted of penicillin in beeswax 40,000 units twice daily for three days, and, as can be seen from Table XVI, the infection was controlled in seven of the ten eyes, but in all the eyes there was considerable disorganization of the vitreous. Though the infection could be regarded as largely controlled, these eyes could not be considered as giving a clinically satisfactory result.

Discussion on Experimental Results

The comparative aqueous levels reached by the use of pure penicillin in the form of ointments or of subconjunctival injections, and by commercial penicillin in massive systemic administration, suggest that the best results are likely to be obtained by subconjunctival injection—a conclusion that stands in spite of individual variations in the experimental animal. Moreover, high aqueous levels persist longer with subconjunctival injections than with the other two methods. The advantages of subconjunctival injection are borne out by the experimental results with infections of the anterior chamber and vitreous. Such infections respond well to subconjunctival therapy in doses of 25,000 units/ml. administered twice daily for three days. In contrast, vitreous infections, though controlled, hardly give clinically satisfactory results when treated either by ointment in the conjunctival sac or by massive systemic injections—at any rate in the dosage employed so far. It would appear that the two factors that put both local application of ointment and systemic administration at a disadvantage are lower initial penicillin levels intraocularly and the evanescent character of these levels. On the evidence available the addition of adrenaline to the subconjunctival penicillin injection would seem to be an advantage, but this requires clarification. For the moment it would seem that while pure penicillin applied locally, either as an ointment or as a subconjunctival injection, is a highly efficacious agent, and systemic administration in massive doses a most useful procedure, the balance of advantages in severe intraocular infections rests with subconjunctival injection with adrenaline and massive systemic administration.

Of these two procedures subconjunctival injection, though it has clinical disadvantages, would seem to be preferable. Apart from the fact that the experimental results indicate that in vitreous infections subconjunctival injection is the only promising procedure, it must be borne in mind that the animal results cannot be applied mechanically to man. In experiments on rabbits, largely identical doses were used either as subconjunctival injections or intramuscularly. Translated into terms of its application to man an intramuscular dose will have to be many times that of the subconjunctival dose. Clinically the question is, not whether a given dose should be injected subconjunctivally or intramuscularly, but whether a dose of 25,000 units of pure penicillin be given subconjunctivally or about fifteen times that amount intramuscularly. Even so it must be emphasized that the advantage, as judged by aqueous level and effect on experimental infections, lies with the smaller dose injected subconjunctivally. It is, however, possible that ultimately the frequent application of concentrated ointments may prove an adequate procedure.

The aqueous level in man after massive subconjunctival injection of pure penicillin has not yet been determined. There is therefore no evidence that the pharmacological and therapeutic experiments recorded here for the rabbit apply to man ; but there is some indirect indication that essentially this is the case. In four patients who received 50,000 units of pu penicillin subconjunctivally the blood level was determined hourly intervals between the first and tenth hours. Two patie had adrenaline together with the penicillin. As can be se from Table XVII, the blood levels were not dissimilar fro those obtained in the rabbit (see Table IV). Moreover, t patients receiving adrenaline showed a more consistent blo level, indicating that the penicillin was being absorbed o slowly into the blood stream. Presumably there was also slo absorption into the aqueous, allowing such level as may reached in the aqueous to be more persistent. The similari in this respect makes one hopeful that the pharmacologic and therapeutic results seen in the rabbit apply to man.

TABLE XVII.—*Subconjunctival Injection of Pure Penicillin in Ma Blood Levels (Units/ml.) reached after 50,000 Units Injected Subconjunctivally*

	Penicillin Only		Penicillin with Adrenaline	
	First Patient	Second Patient	First Patient	Second Patient
At 1 hour ..	1	0·5	1	2
,, 2 hours ..	0·125	0·125	1	0·25
,, 3 ,, ..	Not tested	0	1	0·125
,, 4 ,, ..	0·03	0·125	1	Not tested
,, 5 ,, ..	0·1	0·125	1	0·25
,, 6 ,, ..	0·25	0	1	0·125
,, 7 ,, ..	0·03	0	0·25	0
,, 8 ,, ..	0·06	0	0·125	0
,, 9 ,, ..	0·06	0	0·5	0
,, 10 ,, ..	0	0	0·5	0
,, 23 ,, ..	0		0	

In the light of the experimental results it was felt that clinic trials with ointment of pure penicillin in high concentrati and with subconjunctival injections both with and witho adrenaline, were justifiable, as was the use of commerc penicillin in massive doses in watery solution, or preferab in beeswax, injected intramuscularly.

Clinical Experiences

Pure Penicillin in External Infections

Adequate control of external infections of the eye by tolerat concentrations of commercial penicillin is readily obtained. T use of pure penicillin might conceivably give better resu and avoid the occasional occurrence of irritation. These a possibilities that have not been explored to any extent, and t results so far obtained can be summarized briefly and a essentially observations on tolerance.

Ointments.—In five patients with acute conjunctivitis and six children with blepharitis ointments containing up to 8,0 units of pure penicillin per gramme were well tolerated an effective. When instilled into the conjunctival sac some oin ment could still be seen after an hour. There was no tangib difference whether " eucerin " L.M. base or petroleum jelly an liquid paraffin (90 and 10 parts of each respectively) was use In subsequent trials only the latter base was used.

The tolerance of the eye to ointments containing 25,00 50,000, and 100,000 units/g. was established by the successf use of such ointments in three cases of hypopyon ulcer, t ointment being instilled at hourly intervals during the first da and at two-hourly intervals subsequently. Tolerance to oin ment containing 100,000 units/g. was also noted in infants wi ophthalmia neonatorum (but an adequate clinical result cou not be obtained, as the treatment of ophthalmia neonatorum b ointments is unsatisfactory, the ointment being difficult to appl when the lids are swollen, and it is, moreover, squeezed out the conjunctival sac by the spasmodic contraction of the infant lids).

Solutions and Suspensions.—Watery solutions of pure pen cillin 10,000 units/ml. were used satisfactorily in the form drops in three cases of acute conjunctivitis. Two drops instill six times at five-minute intervals and subsequently six times half-hourly intervals were well borne. In six cases of ophth mia neonatorum concentrations of 10,000 and 12.000 units methyl cellulose solution (2%, in a buffered aqueous mediu used in the same manner were likewise well tolerated, as w the use in four further cases of a suspension of pure penicil in oil (castor oil or liquid paraffin) in a concentration of 10,0

units/ml. A suspension of pure penicillin in castor oil (10,000 units/ml.) instilled at hourly intervals for five days proved efficacious in a case of hypopyon ulcer.

Pure Penicillin in Intraocular Infections

The opportunity of studying the value of pure penicillin in eight cases of post-operative infection presented itself by the kind co-operation of colleagues, and the following remarks are based on their reports.

1. In a case of infection after cataract extraction in a diabetic patient one subconjunctival injection of 25,000 units was given on the seventh day after the infection had become established. There was no tangible improvement on the following day, and the eye was excised.

2. In another case of infection after cataract extraction subconjunctival injections of 50,000 units of pure penicillin were given on the sixth and seventh days after the onset of infection, combined with five doses of 100,000 units of commercial penicillin intramuscularly at 12-hourly intervals. There was considerable improvement, but some relapse on the ninth day, when the course was repeated. The infection was clinically controlled, but the eye now shows evidence of early shrinking. A course of sulphamezathine was given without result between the third and sixth days (before penicillin treatment).

3. In this case infection was noted at the first dressing 24 hours after a cataract extraction, and consisted of a localized exudate in the anterior chamber at the temporal side of the corneal incision. Powder of commercial penicillin (about 30,000 units) was sprinkled on the wound, and the procedure was repeated later in the day and again on the following morning, a total of 100,000 units being used. There was a distinct improvement, but the infection still persisted. Sixty hours after the operation a subconjunctival injection of 50,000 units of pure penicillin was given, and the following morning (72 hours after operation) the infection appeared under control, so that further treatment was suspended. Forty-eight hours later there was a relapse; two subconjunctival injections were given, with definite improvement by the following day, when two further injections were made, and one more the day after. Recovery since has been steady and uninterrupted.

4. In a further case of infection after cataract extraction treatment was begun after five days, and consisted in opening the anterior chamber and irrigating with 10 ml. solution of pure penicillin containing a total of 100,000 units. This was repeated on four subsequent days. The infection was checked, and though the eye is likely to be retained it is unlikely to have any useful vision. An organized mass of exudate is still present in the anterior chamber after 14 days. (A subsequent report suggests that after capsulectomy useful vision is likely to be present.)

5. A fully developed panophthalmitis was observed in a patient three years after a trephine operation for a glaucoma. Treatment consisted of drops of commercial penicillin 2,000 units/ml. at half-hourly intervals, with considerable improvement after 24 hours, when the cornea was clearer and a purulent infiltration of the vitreous could be seen. Treatment was continued for two more days without much result. Intramuscular injection of 100,000 units of commercial penicillin was then instituted at 3-hourly intervals for 72 hours, resulting in further control of the infection in the anterior chamber but not of that in the vitreous. Daily injection of 50,000 units of pure penicillin subconjunctivally was begun 14 days after the patient first came under observation, and continued for 4 days. This led to the vitreous becoming less dense, and its reflex, as seen by oblique illumination, less yellow and more greyish; but the eye must be regarded as functionally lost.

6. In a further case of post-operative infection a simple extraction of a hypermature cataract had been performed with loss of fluid vitreous at the operation. The patient was a diabetic. At the first dressing, 24 hours later, slight mucoid discharge was seen, and penicillin drops 2,500 units/ml. were instilled. Twenty-four hours later a severe infection was fully established: the lids were red and oedematous, chemosis was marked, and there was total hypopyon. A course of sulphamezathine was instituted, penicillin drops 2,500 units/ml. were instilled 2-hourly, and injections of penicillin intramuscularly were begun—two of 50,000 units at intervals of 6 hours and subsequently 25,000 units 3-hourly. During the 3 days this treatment was continued the condition steadily deteriorated, and pus began to exude from the corneal section. Subconjunctival injections of 50,000 units of pure penicillin in 0.5 ml. of 2% "novocain" were then given at 8-hourly intervals, with ointment 100,000 units/g. instilled into the conjunctival sac 2-hourly. After 6 days of this treatment the condition had improved to the extent that the patient was now able to open his eyes, and the infection had become localized to the upper segment of the anterior chamber. The injections were now causing pain, and these as well as the ointment were discontinued, atropine drops and fomentations only being used. Further improvement continued for 12 days, when there was a sudden worsening. The eye became intensely red and engorged and pus in the vitreous could be seen through the pupil. There was no perception of light. A complete hypopyon rapidly formed and the eye was eviscerated. The vitreous was found to be full of pus.

7. In a case of intracapsular extraction complicated by prolapse of vitreous the iris was muddy at the first dressing three days later. Twenty-four hours later a small hypopyon was present. A course of sulphamerazine was instituted and ointment of pure penicillin 50,000 units/g. instilled into the conjunctival sac 2-hourly. In spite of treatment continued for 3 days the hypopyon increased, and the patient showed intolerance to the sulphonamide. Treatment, apart from atropine drops, was changed to subconjunctival injections of 50,000 units of pure penicillin in 0.5 ml. of 2% novocain at 6-hourly intervals. After eight injections the hypopyon had disappeared; the eye was almost white but showed post-operative iritidic adhesions. Though the eye was saved, the ultimate outcome as regards vision is still uncertain.

8. A man aged 58 had undergone a second operation for retinal detachment by surface coagulation and three micropunctures. Ophthalmic catgut was used for re-attaching the external rectus severed during the operation, and an intragluteal injection of 50,000 units penicillin in oil was given prophylactically. At the first dressing 48 hours later there was much chemosis, the anterior chamber was deep, and the iris yellowish green. Two further intragluteal injections of 150,000 units of penicillin in oil were given the same day, and full doses of sulphamerazine instituted and continued for 7 days. On the following day the condition was worse, the cornea now being cloudy, and hypopyon was present. Further deterioration occurred during the next 24 hours; the vitreous seen through the remaining area of clear cornea was cloudy. Subconjunctival injections of 50,000 units pure penicillin in 0.5 ml. of 2% novocain with adrenaline were given at 6-hourly intervals, a total of 20 injections being used. Improvement was noted after the sixth injection, and at the end of the course of injections there was no hypopyon, the cornea was clear, and the iris less yellow; the anterior chamber was still deep. General administration of 150,000 units of penicillin in oil was continued daily for 3 days, when all treatment was suspended. On the following day the eye was quiet, the cornea clear, the iris normal in colour, and the anterior chamber almost normal in depth. Eight days later the patient was discharged. The eye is still somewhat red, there was a small hyphaemia, and there appears to be a haemorrhage in the vitreous.

Apart from these eight cases of post-operative infection three cases of infection of the vitreous associated with intraocular foreign body were treated.

1. A man aged 27 sustained a perforating injury of his left eye while using a hammer and chisel. The lens was semi-opaque, the pupil irregular, and there was no red reflex. A foreign body was extracted by the magnet from the vitreous on the same day, and a scleral suture inserted. Convalescence was uneventful for the 5 succeeding days, when suddenly much congestion and chemosis set in. Ointment of pure penicillin 100,000 units/g. was then instilled at 2-hourly intervals for 24 hours, and 50,000 units of pure penicillin in 0.5 ml. of water was injected subconjunctivally and repeated on eight further occasions at 12-hourly intervals. The injections proved painful. After the first two, which did not seem to influence the infection, the wound was explored and the scleral sutures removed, though they did not appear to be infected. In spite of continued treatment the infection progressed, and on the tenth day the eye was eviscerated. The vitreous was found to be a purulent mass. Two hours before evisceration 50,000 units of pure penicillin were injected subconjunctivally, and at evisceration the aqueous and some vitreous were collected for penicillin assay and culture. The penicillin content was found to be 32 units in the aqueous and 0.5 unit in the vitreous. A penicillin-sensitive *Staph. aureus* was present in the vitreous, but there were no organisms in the aqueous.

2. In a man of 21, whose right eye was hit by a small ball-bearing 48 hours previously, hypopyon filling a third of the anterior chamber, and grey opacities in a hazy vitreous, were present when he was first seen. Because of the established infection no immediate attempt at removing the intraocular foreign body was made. Ointment of pure penicillin 100,000 units/g. was instilled at 2-hourly intervals for 3 days, with but little effect. After 14 subconjunctival injections of 50,000 units of penicillin at 6-hourly intervals the infection seemed sufficiently controlled to warrant an attempt at magnet-extraction of the foreign body. There was, however, no response to the magnet. Two days later the infection flared up, and was not controlled by eight subconjunctival injections of 50,000 units. The eye had to be eviscerated, and the vitreous was found to be a purulent mass.

3. While hammering a boiler, three days before admission, a man aged 38 sustained a perforating injury to his right eye. On admission the vitreous was grey and a hypopyon occupying one-third of the anterior chamber was present. *X*-ray examination showed a foreign body located just outside the globe. A course of sulphamezathine was given unsuccessfully for 3 days, and then suspended for penicillin

therapy. This consisted in the instillation of ointment (100,000 units/g.) 2-hourly by day and 4-hourly at night, and of 20 subconjunctival injections of 50,000 units in 0.5 ml. of 2% novocain solution given at 6-hourly intervals. As a re-location put the foreign body as just inside the globe an attempt at magnet-extraction was made. This, however, proved unsuccessful. The hypopyon disappeared after 3 days' treatment with penicillin, and an organized opacity in the upper part of the vitreous could be seen. This mass has not been influenced by penicillin therapy, and though the treatment seems to have checked the development of panophthalmitis the eye is now shrinking and must be regarded as functionally lost.

Subconjunctival Penicillin in Interstitial Keratitis

Four patients were treated. A girl aged 19 years received twelve subconjunctival injections of 25,000 units in one eye, generally at daily intervals, together with a systemic course of 200,000 units daily for seven days. The injections were well tolerated, though some conjunctival adhesions seemed to form towards the end of the course. The other three patients were soldiers with interstitial keratitis developing apparently as a result of acquired syphilis. In the case of the girl there was rapid and progressive whitening of the eye. Three months later she still had a central corneal haze reducing vision to 6/18; this, however, practically disappeared during the subsequent two months, when vision rose to 6/9. Two of the men responded well to four and six subconjunctival injections of 25,000 units, vision rapidly becoming normal, though they had shown no response to classical local and antisyphilitic treatment. In the third man the response was poor.

Subconjunctival Penicillin in Hypopyon Keratitis

In addition to the three cases of hypopyon ulcer treated successfully with ointments of pure penicillin and one by penicillin in oily suspension there were five others treated by subconjunctival injection.

The first case was that of a man aged 68, who initially responded to pure penicillin ointment (100,000 units/g.) applied hourly for 12 hours. Three days later there was a sudden and severe relapse, the anterior chamber showing a total hypopyon within 24 hours. At this stage two subconjunctival injections of 25,000 units at intervals of 24 hours failed to influence the condition, the eye showing evidence of panophthalmitis. On admission the conjunctival swab had shown *Staph. aureus* microscopically, and culture revealed *Ps. pyocyanea* [? a contaminant]. Unfortunately no swab was taken of the contents of the anterior chamber when the eye was ultimately eviscerated.

In a second patient, a lady aged 83, initially more severely affected than the man with a hypopyon of five days' standing, the outcome was more favourable. Hourly instillation of pure penicillin in a suspension of castor oil (10,000 units/ml.) led to rapid improvement within 15 hours. As the cornea was still hazy, some hypopyon still present, and the general condition poor (the patient had a large carbuncle on the nose), two subconjunctival injections of 50,000 units with adrenaline were given at 12-hourly intervals. The eye was now normal in appearance, and penicillin in oil (10,000 units/ml.) was continued for a further 48 hours.

In a third patient, with hypopyon filling half the anterior chamber, pure penicillin in ointment form (25,000 units/g.) was applied at 2-hourly intervals for 48 hours with no marked improvement. One injection of 50,000 units with adrenaline was then given subconjunctivally, and the hypopyon diminished considerably. A second subconjunctival injection was given after 48 hours. Three days later the anterior chamber was clear. Application of ointment at 2-hourly intervals was continued throughout.

In a further case of hypopyon complicating an old-established iridocyclitis with secondary cataract and a tension of +3, treatment with atropine and penicillin drops 500 units/ml. at 3-hourly intervals for 5 days broke down some iris adhesions but did not affect the hypopyon or tension. Subconjunctival injections of 50,000 units of pure penicillin were now given on three occasions on alternate days, while ointment of pure penicillin 100,000 units/g. was instilled 3-hourly during the first 4 days. On the sixth day the hypopyon had become barely visible as a mere crescent. Further treatment by short-wave therapy brought the tension down to normal.

In a case of recurrent hypopyon iritis associated with rheumatoid arthritis, treatment for 12 days with ointment of commercial penicillin 800 units/g. gave no response. There was some improvement after subconjunctival injection of 50,000 units of pure penicillin daily for 3 days, and resolution after 14 days' treatment with penicillin ointment 100,000 units/g. instilled 2-hourly. The end-result was excellent, but it is doubtful whether penicillin treatment contributed to it.

Discussion

The studies recorded here indicate that pure penicillin is remarkably well tolerated by the eye, and that dosage need no longer be limited by the intolerance of the eye to the impure supplies available till recently. There seems to be no upper limit of concentration of drops and ointments of penicillin that can be instilled into the conjunctival sac, while massive amounts can be given subconjunctivally. It is also clear that ointments in high concentration instilled into the conjunctival sac allow adequate penetration into the anterior chamber of the eye. This applies still more to subconjunctival injections, so that the current teaching that adequate therapeutic levels cannot be obtained in the interior of the eye is no longer valid. It is also established that adequate levels of penicillin can be obtained by massive systemic administration. The results of biological assay are confirmed by the experiments in infection of the interior of the eye, for infections of the anterior chamber respond to instillation of concentrated ointments, to systemic administration of massive doses, and to subconjunctival injections. Infections of the vitreous are, however, only partially controlled by systemic administration and by the application of ointments, and subconjunctival injections appear to be the only satisfactory method of treating vitreous infections.

The clinical use of penicillin in intraocular infections still requires clarification. The range of efficacy of ointments for intraocular infections has still to be established, as has the frequency of application. Experimental findings suggest that adrenaline should be used together with pure penicillin for subconjunctival injections, but it remains for clinical trial to establish whether this is necessary or desirable, as also whether 2% novocain solution should replace water as a solvent for the penicillin in such patients who do not tolerate injections of 50,000 units subconjunctivally. Likewise clinical trial will have to establish the best way of giving massive doses of penicillin systemically—whether in aqueous solution or in oily suspension in beeswax. In intraocular infections involvement of the vitreous is always a grave complication. The experimental results recorded here indicate that even a low-grade infection has serious implications, possibly because of the disorganization of the vitreous consequent on physical alterations of its colloidal state. Only the most effective measures against bacterial action are therefore likely to be clinically efficient.

The limited clinical data recorded here bring out forcibly three essential points in penicillin treatment of intraocular infections. In the first place, early treatment is essential; little is to be expected once there is extensive disorganization of the eye from the suppurative reaction. Secondly, it is important to continue treatment for at least 24 hours, and possibly as long as 72 hours, after the eye is apparently normal, as otherwise residual infection may readily flare up—a point that is well appreciated in the treatment of ophthalmia neonatorum. Thirdly, in infection of the anterior chamber evacuation and irrigation at an early stage, supplementary to subconjunctival injections, may prove advisable, but it is clear that little can be expected from irrigation by itself, with its momentary antibacterial effect. The considerable amount of work that has been done on sustaining adequate levels of concentration of penicillin is in itself a strong indication against irrigation as a sole method of treatment.

The adequate use of pure penicillin for intraocular infections promises control of a hitherto uncontrollable condition, but the optimum modes of use have still to be established. At the moment the most promising approach would seem to lie with subconjunctival injections of 50.000 units of pure penicillin at intervals of 6 hours. In the case of vitreous infections it may prove necessary to combine subconjunctival with massive systemic injections, and possibly even direct intravitreal injection of pure penicillin.

Summary

Pure penicillin is well tolerated by the eye when applied locally in ointments containing up to 100,000 units per gramme or in watery solutions. Intravitreal injection of pure penicillin, though not free from secondary effects, is also well tolerated. Repeated subconjunctival injections of 50,000 units in 0.5 ml. of water are well tolerated.

Adequate therapeutic levels of penicillin can be obtained in the aqueous by the instillation of concentrated ointments into the conjunctival sac. Higher and more persistent levels are secured by subconjunctival injections. Adequate though rather more evanescent levels are obtained by the systemic administration of penicillin in massive doses. When subconjunctival injections are used the addition of adrenaline increases persistence; intramuscular injection of penicillin in beeswax also gives more sustained levels.

Experimental infections of the anterior chamber are readily controlled by the use of concentrated ointments, subconjunctival injections, and systemic administration of penicillin. In vitreous infections subconjunctival injection is the only procedure that was found satisfactory; no more than partial control is obtained by other methods.

Preliminary clinical trials indicate that the experimental results are largely applicable to man.

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PENICILLIN IN TREATMENT OF ACUTE PUERPERAL MASTITIS

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Since penicillin is now universally available, and especially as it has come to our notice that some clinicians are dissatisfied with its effect in acute puerperal mastitis, a short communication on our own somewhat limited experience would seem appropriate, and might serve as an encouragement for a further trial of our suggested technique. Theoretically, since the predominant causal organism in infection of the breast is *Staphylococcus aureus*, penicillin should prove effective. It appears to us that the unsatisfactory results of which we have heard have been due to (*a*) the use of local therapy only, or (*b*) underdosage. Vaughan Hudson (1944) found that local penicillin alone was not successful in acute soft-tissue infections unless they were entirely confined to the surface, and this is not the case by the time a diagnosis of acute puerperal mastitis is made. More recently Hodgkinson and Nelson (1945) have reported from the United States on 24 cases of acute puerperal mastitis successfully treated with large doses of penicillin administered systemically.

The principles underlying the treatment of this disease are, first, emptying of the breast, and, secondly, adequate control of the infection. The first principle may be attained by suppressing lactation by means of oestrogens, or by regular emptying with a breast pump, or by allowing the infant to suckle. We prefer to keep the breast empty by permitting the child to feed, but if the discomfort caused to the patient is very great then we temporarily discontinue suckling and give a small dose of stilboestrol (usually not more than 1 mg. in 24 hours). Adequate control of the infection can, in our opinion, be attained only by the systemic administration of *large* doses of penicillin. We administer it by 3-hourly intramuscular injections of 12,000 to 20,000 Oxford units.

Our criteria for starting treatment are pyrexia, associated with flushing, and hardening of the breast; but from some of our cases it appears that pyrexia with pain in the breast, even though there are no other changes, should be considered an indication for treatment.

Results

Case 1.—Primipara, aged 23. 6/11/45: Manual rotation and forceps delivery on account of persistent occipito-posterior presentation. Breast-feeding started. 14/11/45: Severe pain in the left breast on suckling. 15/11/45: T. 102° F. (38.9° C.); P. 100. Hard inflamed area in outer and upper quadrant of the left breast. Suckling very painful. Breast rested for 12 hours and emptied with pump. Penicillin started. Stilboestrol 0.5 mg. 16/11/45: T. 100° F. (37.8° C.). 17/11/45: T. 99.6° F. (37.55° C.). Breast fluctuating. 18/11/45: T. 99.4° F. (37.4° C.). Abscess aspirated and 25 ml. of pus obtained. 19/11/45: T. 98.4° F. (36.9° C.); P. 90. Aspiration again produced pus. No pain. Flush gone. 20/11/45: T. 98.2° F. (36.8° C.); P. 82. No pain. No pus obtained. Slight thickening at site of abscess. 21/11/45: T. 98.2° F. (36.8° C.); P. 72. Breast appears normal. Lactating well. 22/11/45: Penicillin discontinued. Total dosage, 1,050,000 Oxford units.

Case 2.—Primipara, aged 33. 3/11/45: Normal delivery. Breast-feeding begun. 14/11/45: Flushed left breast. T. 99° F. (37.2° C.); P. 100. 15/11/45: T. 102° F. (38.9° C.); P. 116. Suckling stopped for 12 hours. Stilboestrol 0.5 mg. Penicillin started. 16/11/45: T. 100° F. (37.8° C.); P. 116. Flush diminished. Less pain. Baby suckling. 17/11/45: T. 98° F. (36.7° C.); P. 96. 18/11/45: T. 98° F. (36.7° C.); P. 90. Breast normal. 20/11/45: T. 98° F. (36.7° C.); P. 80. Penicillin discontinued. Total dosage, 525,000 Oxford units.

Case 3.—Primipara, aged 21. 6/4/46: Normal delivery. Breast-feeding started. 16/4/46: Baby developed a septic finger, which was treated with penicillin. Breast-feeding continued. 20/4/46: Baby recovered. Mother's temperature, 101° F. (38.3° C.); P. 100. Flushed left breast. Penicillin begun. Breast-feeding continued. 21/4/46: T. 103.8° F. (39.9° C.); P. 126. 23/4/46: T. 98° F. (36.7° C.); P. 80. Little pain, definite thickening and hardness inner and lower quadrant of left breast. 24/4/46: T. 98° F. (36.7° C.); P. 82. No flush. Thickening resolving. 25/4/46: T. 98° F. (36.7° C.); P. 82. Thickening almost completely resolved. 26/4/46: Breast normal. Penicillin discontinued. Total dosage, 600,000 Oxford units.

Case 4.—Para-2, aged 20. 8/4/46: Normal delivery. Breast-feeding started. 17/4/46: T. 101.2° F. (38.4° C.); P. 100. Flushing and thickening of the left breast. Penicillin begun. 18/4/46: T. 98.6° F. (37° C.); P. 104. 19/4/46: T. 100.8° F. (38.2° C.); P. 104. 20/4/46: T. 98° F. (36.7° C.); P. 90. Breast normal. 22/4/46: T. 98° F. (36.7° C.); P. 90. Penicillin discontinued. Total dosage, 600,000 Oxford units.

Case 5.—Primipara, aged 21. 20/4/46: Normal delivery. Breast-feeding started. 26/4/46: Cracked nipples. Breast rested for 12 hours. 27/4/46: T. 102° F. (38.9° C.); P. 130. No abnormality found on examining breasts. 28/4/46: T. 103° F. (39.4° C.); P. 130. Definite thickening and tenderness outer and upper quadrant of left breast. Penicillin begun. 29/4/46: T. 99.4° F. (37.4° C.); P. 96. Breast flushed and thickened. 30/4/46: T. 98° F. (36.7° C.); P. 98. Flush less. Thickened area considerably smaller. 1/5/46: T. 98° F. (36.7° C.); P. 90. No flush. 2/5/46: T. 98° F. (36.7° C.); P. 90. Breast normal. 4/5/46: T. 98° F. (36.7° C.); P. 80. Penicillin discontinued. Total dosage, 700,000 Oxford units.

Case 6.—Para-2, aged 26. 28/4/46: Normal delivery. Breast-feeding begun. Owing to shortage of beds this patient was transferred to the district on the third day of the puerperium. She herself attempted to discontinue breast-feeding on the tenth day and developed acute puerperal mastitis. 12/5/46: Readmitted to hospital. T. 100° F. (37.8° C.); P. 106. Tender flushed left breast. Thickened area 2 in. (5 cm.) in diameter in upper and outer quadrant. Penicillin started. Baby put back on breast and all artificial feeding stopped. 13/5/46: T. 100° F. (37.8° C.); P. 104. Breast flush limited to upper and outer quadrant. Tenderness also limited to this area. 14/5/46: T. 100° F. (37.8° C.); P. 88. Thickening now 1 in. (2.5 cm.) in diameter. Slight flush. Slight tenderness. 15/5/46: T. 97.8° F. (36.55° C.); P. 64. No flush. Slight thickening. 16/5/46: T. 98° F. (36.7° C.); P. 80. No thickening, flush, or tenderness. Penicillin discontinued. Total dosage, 500,000 Oxford units. Two weeks later this patient returned to the clinic. She was still lactating freely, but the baby was again being artificially fed. She was instructed to re-establish breast-feeding, but has since refused to return to clinic.

Case 7.—Para-3, aged 30. 29/4/46: Normal delivery. 5/5/46: Cracked nipples. Breast rested for 12 hours. 7/5/46: T. 101.8° F. (38.8° C.); P. 100. Right breast very flushed and tender. Penicillin started. 8/5/46: T. 98.4° F. (36.9° C.); P. 88. 9/5/46:

T. 98° F. (36.7° C.); P. 82. 10/5/46: T. 97° F. (36.1° C.); P. 80. Breasts normal. Penicillin discontinued. Total dosage, 300,000 Oxford units.

Case 8.—Primipara, aged 25. Delivered at another hospital and admitted 9/5/46 on account of an infected perineal laceration, for which she was being treated with sulphamezathine. The baby was not admitted. 10/5/46: T. 100° F. (37.8° C.); P. 100. Tender flushed left breast. Lactation suppressed with stilboestrol. Penicillin begun and sulphamezathine discontinued. 11/5/46: T. 100° F. (37.8° C.); P. 104. Slight flush and tenderness over an area the size of a penny. 12/5/46: T. 99.6° F. (37.55° C.); P. 86. Breasts normal. 15/5/46: T. 98° F. (36.7° C.); P. 80. Penicillin discontinued. Total dosage, 500,000 Oxford units.

Case 9.—Para-3, aged 32. 5/6/46: Normal delivery. Breast-feeding begun. 12/6/46: T. 99.6° F. (37.55° C.); P. 90. Outer and lower quadrant of left breast flushed and tender. Penicillin started. 13/6/46: T. 97.6° F. (36.4° C.); P. 88. Flush almost gone. Slight tenderness. 14/6/46: T. 97.8° F. (36.55° C.); P. 86. Breast normal. 18/6/46: T. 97° F. (36.1° C.); P. 80. Penicillin discontinued. Total dosage, 500,000 Oxford units.

Case 10.—Para-2, aged 26. 9/6/46: Normal delivery. Breast-feeding begun. 17/6/46: T. 100° F. (37.8° C.); P. 120. Flush, tenderness, and induration in inner and lower quadrant of right breast. Penicillin started. 18/6/46: T. 98° F. (36.7° C.); P. 110. Severe pain in breast. Stilboestrol 3 mg. As breast-feeding did not increase the pain it was continued. 19/6/46: T. 97° F. (36.1° C.); P. 84. Flush decreased. Localized hardening the size of a walnut. 20/6/46: T. 97.6° F. (36.4° C.); P. 84. Breast normal. 22/6/46: T. 97.6° F. (36.4° C.); P. 72. Penicillin discontinued. Total dosage, 500,000 Oxford units.

Comment

The above constitute the total number of cases of acute puerperal mastitis seen in the Princess Mary Maternity Hospital between November, 1945, and July, 1946, during which time 1,537 deliveries took place. In these cases there was quick resolution, with no prolonged disorganization of the breast; in only one instance did suppuration occur, and this was treated by closed aspiration. Lactation was not interfered with, and breast-feeding was maintained except in Case 8, where the baby was not admitted to hospital. The total period of disability was not longer than 7 days, and discomfort was never present for more than three days. The following table shows the length of time taken to achieve a cure as judged by the disappearance of all signs.

2	cases	were cured	in	2 days
4	,,	,,	,,	3 ,,
1	case	was	,,	4 ,,
1	,,	,,	,,	5 ,,
1	,,	,,	,,	6 ,,
1	,,	,,	,,	7 ,,

No baby became infected as a result of the continued suckling. There were no recurrences after the cessation of treatment.

These results are in such great contrast to those of the usual methods that the treatment seems worthy of an extended trial, for it appears that, provided early treatment is instituted, penicillin can abolish the morbidity of this painful and crippling puerperal complication. Our results are in agreement with those of Hodgkinson and Nelson, who suggest that, owing to the ineffectiveness of sulphonamide therapy in this disease, it should be entirely replaced by penicillin.

We wish to thank Dr. Jean Grant and Dr. G. I. Isaacs for their assistance in treating these cases.

References

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Two motion pictures on tuberculosis case-finding with miniature film mass radiography of the chest have just been completed for the U.S. Public Health Service, under the supervision of the Tuberculosis Control Division. The films demonstrate the techniques, the staff, procedures, and equipment required for: (1) routine admission miniature film chest *x*-ray examination of all patients and personnel entering general hospitals; (2) miniature film mass radiography in community tuberculosis case-finding programmes. These are teaching and orientation films for an audience of professional, technical, or administrative personnel, or trainees, in the fields of medicine, public health, and hospital care. The film prints are 16 mm. size, black and white, with sound. They may be purchased from Castle Films, Inc., 30, Rockefeller Plaza, New York 20, N. Y.: routine admission chest *x* ray in general hospitals, $23.00 per print; techniques of group chest *x* ray services, $21.00 per print.

USE OF "BENADRYL" FOR PENICILLIN URTICARIA

PRELIMINARY REPORT

BY

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"Benadryl" (β-dimethylaminoethyl benzhydryl ether hydrochloride) is a synthesized chemical compound said to possess both anti-allergic properties and antispasmodic activity capable of relieving spasms of smooth muscle. This antihistamine agent is administered orally in the form of capsules, the dose for an average adult being one capsule (50 mg.) three or four times daily. Its toxic effects are said to be minimal but include a sensation of drowsiness and nausea. In consequence the simultaneous administration of barbiturates or opium derivatives should be conducted with caution. During the past year this drug has been undergoing extensive trials in the United States of America, and has shown encouraging results as a palliative for urticaria, angioneurotic oedema, serum sickness, and erythema multiforme; while hay-fever and vasomotor rhinitis have also been treated.

One of its uses in the U.S.A., and doubtless soon on this side of the Atlantic too, is the symptomatic treatment of urticaria occurring in patients undergoing penicillin therapy. This condition, which may arise at any time during treatment, often becomes apparent at the end of a 7½- or 12-day course in the treatment of syphilis. Generalized urticaria may be associated with oedema of the eyelids, swellings of the ankles or wrists, and effusions into joints, and, when treated symptomatically by means of adrenaline and ephedrine, usually takes 3 to 5 days to subside completely. The frequency of this complication depends to some extent on the particular batch of penicillin used or on the medium in which it is prepared. In America the early penicillin in oil–beeswax mixtures were said to be more liable to cause urticaria than penicillin in aqueous solution. It is therefore likely that this drug will be widely used in this connexion and the preliminary reports from America are most encouraging.

The following describes the action of "benadryl" on six cases of urticaria, five of which were considered to be due to intramuscular penicillin therapy. The penicillin used throughout was manufactured on Feb. 6, 1946, by the Distillers Company, Ltd.; the batch number was 0025.

Case I

A young man of 24, suffering from congenital syphilis with interstitial keratitis. The blood Wassermann was strongly positive and the quantitative Kahn 10 units. The cerebrospinal fluid had a protein value of 80 mg. per 100 ml. and contained a slight excess of globulin, but was otherwise normal. There was no history of previous allergy. In April, 1946, he received 720,000 units of penicillin in 36 three-hourly injections for a septic throat following dental extraction.

Present Attack.—Between Aug. 3 and 3 a.m. on Aug. 16, 1946, he was given a total of 4,000,000 units of penicillin (40,000 units every three hours). Some complaints were made of local pain after these injections. At 10 a.m. on the 17th there was slight urticaria, with a small lesion below the left eye and a larger one on the left flank. When seen again at noon, four more lesions had appeared on the extensor surface of the right forearm. One capsule (50 mg.) of "benadryl" was given t.i.d. for one day, and by the following morning the urticaria had entirely subsided and there was no recurrence. No untoward reactions were noted. The maximum temperature recorded during the attack was 99° F. (37.2° C.), and a blood count on Aug. 19 showed: W.B.C., 8,800 per c.mm. (polymorphs, 48.5%; lymphocytes, 44%; mononuclears, 4%; eosinophils. 3.5%).

Case II

Male aged 38, with a diagnosis of latent syphilis. This was discovered in August, 1945, when the cerebrospinal fluid was normal but the blood Wassermann was strongly positive and the quantitative Kahn 20 units. Since then, though antisyphilitic treatment had been continuous, at the time of admission the Wassermann was still strongly positive and the quantitative Kahn 2 units. There had been a previous attack of urticaria following an injection of antitetanic serum while in India in 1935. In September, 1945, he received

2,400,000 units of penicillin over 7½ days without ill effect. This was consolidated with two full courses of neoarsphenamine and bismuth, which were completed in July, 1946.

Present Attack.—Penicillin therapy was begun on July 26, 1946, and injections of 40,000 units were made every three hours. On Aug. 6, when 3,120,000 units had been administered, generalized urticaria developed involving the back, thighs, wrists, and knees. There was no pyrexia, and a blood count on this day showed the W.B.C. to number 8,800 per c.mm. (polymorphs, 52%; lymphocytes, 41%; mononuclears, 4.5%; eosinophils, 2%; basophils, 0.5%). One capsule (50 mg.) of "benadryl" was then administered orally. By the following day there was some improvement, and the dose was increased to one capsule t.d.s. By the 8th further improvement was evident, there remaining only a few scattered erythematous patches. Three more capsules were given, making a total dosage of 350 mg. given over 2½ days, and by the next day the skin was quite clear.

While the result was not dramatic, the improvement was steady and maintained. The usual duration of such a severe reaction before improvement is manifest is, in my experience, about 4 days.

Case III

Man aged 29, with a diagnosis of sero-positive primary syphilis. There was no history of allergy or of previous penicillin treatment.

Present Attack.—Between July 17 and 24, 1946, a total of 2,400,000 units of penicillin were administered in conjunction with 10 daily intravenous injections of 0.06 g. of mapharside. The arsenic injections were completed on the 28th, at which time a white cell count showed W.B.C., 8,000 per c.mm. (polymorphs, 61%; lymphocytes, 33.5%; mononuclears, 4.5%; basophils, 1%). On this day he developed severe generalized urticaria of left thigh, buttocks, and both legs. He was given two doses of adrenaline 10 min. (0.6 ml.) and tab. ephedrin. 1/2 gr. (32 mg.) t.i.d. On the 29th the urticaria was unchanged in severity, and one capsule of "benadryl" (50 mg.) was prescribed t.d.s. By the following morning four capsules (200 mg.) had been taken, but the urticaria was worse, and it was decided to give a further 10 minims of adrenaline in addition. This time the administration had rather alarming results. The patient at once became pallid, developed a rapid thready pulse, and collapsed. As he recovered, his temperature rose within an hour to 101° F. (38.3° C.). A blood count gave the following results: R.B.C., 5,030,000; Hb, 99%; W.B.C., 13,300 (polymorphs, 83.5%; lymphocytes, 13.5%; mononuclears, 2%; basophils, 1%). At this time it was thought that the severe reaction to the adrenaline might in some way be aggravated by the concurrent administration of "benadryl." Both drugs were therefore discontinued.

On the 31st the general condition was much improved, though intense pallor persisted. The urticarial lesions were still pronounced on the thighs and chest, and the temperature was 99° F. (37.2° C.). Ephedrine 1/2 gr. (32 mg.) t.i.d. was then renewed, and by the following day the lesions were subsiding, though the temperature remained at the same level. The patient continued with the ephedrine and by the 8th the skin was normal, but the temperature was still 99° F. He was discharged to duty on Aug. 14.

Case IV

A youth of 18½ with recurrent impetigo; the lesions were on the face and behind the ears. There was no history of previous allergy. In June, 1946, he had been admitted to hospital with impetigo of the face, and was treated with penicillin cream for two weeks. Two weeks after discharge the condition relapsed, and he was readmitted and treated with penicillin cream for a further week. After another week at his unit, a second relapse occurred, and he was admitted to hospital again on Aug. 3.

Present Attack.—He was treated locally for 4 days with penicillin cream, after which time intramuscular injections of penicillin were given. When he had received 8 three-hourly injections to a total of 320,000 units he developed a generalized urticaria and had a temperature of 101° F. (38.3° C.). Three capsules of "benadryl" (150 mg.) were given over 24 hours with entirely satisfactory results, the urticaria disappearing.

Case V

A 19-year-old youth, with impetigo (beard area), giving a history of penicillin sensitivity. He was admitted to hospital on July 22, 1946, having been treated elsewhere with penicillin cream for impetigo of the face. He thought this had made the condition worse. He was then treated with intramuscular penicillin for 26 three-hourly injections of 40,000 units up to a total dose of 1,040,000 units, and at the same time a gentian-violet lotion was applied to the face. The local condition showed considerable improvement, but on July 30 penicillin cream was again applied and the skin relapsed.

Present Attack.—On Aug. 11 it was decided to give him a further course of penicillin, but by the next day he had severe generalized urticaria with oedema of the eyelids, swelling of both wrists, and an effusion in both knee-joints. Three capsules of "benadryl" (150 mg.) were given on that day, and on the 13th the urticaria had gone, though the oedema around the eyes and wrists persisted. This too had subsided by the next day, and the "benadryl" was continued until a total dose of 450 mg. had been given over 3 days with entirely satisfactory results. On the following day, however, there was a relapse, both of the oedema around the eyes and wrists and also of the urticaria. This time it was treated by ephedrine, and the condition subsided gradually over 5 days. The temperature was normal throughout.

Case VI

A youth aged 18. The diagnosis in this case was giant urticaria and drug sensitivity. There was no history of previous allergy or sulphonamide administration. The patient was a seborrhoeic subject and had some lesions of seborrhoeic dermatitis on the chest of some two months' duration.

He was admitted on July 19, 1946, with an acute oedema of his penis giving it a corkscrew appearance. He had always had phimosis. There was no evidence of subpreputial or urethral discharge, and his Wassermann and Kahn reactions later proved negative. He was given two divided doses of adrenaline mviii (0.5 ml.) and ephedrine gr. 1/2 (32 mg.) t.i.d., and a course of sulphathiazole, 1 g. 4-hourly, was begun. Next day, there being little change, the treatment was repeated. By the 22nd, however, after receiving 15 g. of sulphathiazole, there appeared a generalized toxic erythema and the scrotum also became oedematous. This was ascribed to the sulphonamide, and the drug was discontinued. A blood count showed: W.B.C., 17,500 (polymorphs, 72%; lymphocytes, 25%; mononuclears, 2.5%; eosinophils, 0.5%). On the 23rd the skin in both groins was weeping. He was treated with calamine lotion and luminal gr. 1/2 thrice daily, and showed steady improvement, as the generalized erythema faded and the weeping areas dried and became inactive.

Present Attack.—On July 27, after receiving a total of 6 gr. (0.4 g.) of luminal, there was slight swelling of the dorsum of the left hand. On the 28th the dorsa of both hands had swelled and two bullae had appeared in the third and fourth finger clefts on the right side, and both thighs, moreover, showed large erythematous and urticarial patches. Treatment was started with "benadryl," a capsule (50 mg.) t.d.s., with very satisfactory results in so far as the urticaria and the oedema subsided within 24 hours. The bullae, however, noticeably increased in size, and four developed on the dorsum of the right hand and one at a similar site on the left. It was then decided to aspirate these as they interfered with flexion of the fingers; some 5 ml. of clear fluid was withdrawn from each. By the 30th no more urticaria had appeared, and the "benadryl" was discontinued after 450 mg. had been given; though the bullae had to be aspirated again on this date.

Improvement was then rapid, and, apart from peeling of some skin that had been affected by the bullae, by Aug. 2 there was no lesion requiring treatment. On the 5th another attack of swelling of the penis and an exacerbation of the seborrhoeic lesions in the groin occurred. As with the previous attacks there was no elevation of temperature, and a blood count showed the W.B.C. to number 10,500 (polymorphs, 63%; lymphocytes, 32%; mononuclears, 3.5%; eosinophils, 1%; basophils, 0.5%). This relapse was treated with "benadryl," one capsule (50 mg.) three times a day. There was great improvement within 24 hours, and by 48 hours the oedema had completely subsided. A total dose of 450 mg. was given for the relapse.

Summary

An account is given of 6 cases of urticaria treated with "benadryl," of which 5 were associated with intramuscular penicillin therapy.

The doses ranged from 150 to 450 mg. in each case.

A reaction was noted in one patient who received concurrent adrenaline.

The results obtained showed success in five cases and failure in one (Case III). Two of the successes relapsed (Cases V and VI), one of which was again treated with the drug with a satisfactory result.

I am grateful to Major B. Schwartz, R.A.M.C., and Major L. Sefton, R.A.M.C., for their help, and to Messrs. Parke, Davis and Co. for kindly supplying me with the "benadryl."

In a White Paper entitled *Organization of the Colonial Service*, recently issued by the Colonial Office, the need for large reinforcements is stressed. Government policy aims at progressive self-government by the peoples in the Colonies, and it is from them that many of the recruits must be drawn. The potentialities and abilities of these peoples have been neglected in the past; they lack the opportunities for education available to candidates in the United Kingdom and Dominions; so the creation of educational facilities will be immediately undertaken by the Government, and the sum of £1,000,000 has already been allocated over the next ten years to enable selected Colonial candidates to receive higher education.

CONGENITAL PATENCY OF THE FORAMEN OVALE CORDIS, WITH SUDDEN DEATH DURING EXERCISE TOLERANCE TEST

BY

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The following case of congenitally patent foramen ovale of the heart in an adult is reported, as it presents a most unusual clinical termination: sudden death from acute cardiac failure.

Clinical Features

The patient, an able-bodied Indian seaman aged 25, with six years' service, was at the time in question serving aboard a light destroyer of the Royal Indian Navy. He was of good-class Muslim family from the Upper Punjab. There was no past history of illness or disability. He had passed his several medical examinations before and after his enrolment in the R.I.N., and his medical records were clear. He had been a notably enthusiastic recruit, with a good record of service, free of any default.

Towards the end of November, 1942, his ship had had a sharp engagement at sea against superior enemy surface forces, and after a running battle of several days, from which H.M.I. ship emerged victorious, it returned, crippled, to port for refitting. The patient reported sick on the day after the arrival in port, being unable to attend the victory parade given in honour of the ship's gallant action. He stated that since the recent naval action, about five days before, he had felt "peculiar," and that if, during the course of his duties, he ran, he felt dizzy, became out of breath, and could feel his heart beating in a peculiar way. These symptoms alarmed him because he had never noticed them before.

On examination by the medical specialist he appeared of good physique and in good health, and had no dyspnoea at rest. His pulse was regular at 68 per minute. He did not exhibit appreciable cyanosis on examination; there was no oedema of the ankles. On auscultation of the heart no murmurs were detected. The patient, a cheery and co-operative lad, then said he "could best demonstrate his complaint after a run" (medical specialist's report), an exercise tolerance test to which his examiner saw no objection. Accordingly the patient was instructed to run to the end of a corridor, a distance of some 20 yards (18 m.). At the end of the corridor, just as he turned to run back, he fell in a faint, from which he did not recover, despite the medical attention at hand. He died in three to four minutes.

Findings at Necropsy

A post-mortem examination was made two hours after death; it was primarily required for purposes of a medico-legal report.

External Examination.—The body was well nourished, of average stature, and of normal skeletal development. There was no clubbing of the fingers or toes, no oedema of the ankles or of subcutaneous tissues anywhere, no cutaneous haemorrhages or other congestive features of the head or neck, and no jaundice.

General Internal Examination.—The muscles and tissues of the body generally were well coloured, there being no evidence of any anaemia. There was no excess of free fluid, nor were there any abnormal contents in any of the body cavities. The organs, apart from the heart and aorta (q.v.), were healthy and did not show any evidence of chronic venous congestion. The blood was still fluid in the heart and vessels, and there was no cardiac, pulmonary, or cerebral embolism.

Cardiovascular System.—The pericardial sac contained only some 3 to 4 ml. of clear straw-coloured fluid. There was no pericarditis. On inspection and palpation the heart was distinctly enlarged, mainly due to a relatively enormous distension of the right atrium, which contained some 9 to 10 oz. (250 to 280 ml.) of dark fluid blood. The great afferent veins, superior and inferior, were unduly swollen with blood. The left side of the heart was not appreciably enlarged, but the left ventricular wall felt unduly hard and thick. The ascending aorta was prominent, and its wall was palpably thickened and rigid. On dissection of the heart the abnormal findings were: (1) a patent foramen ovale between the atria, fairly high up; (2) an advanced and confluent atheroma of the wall of the ascending aorta, with a diminishing degree of atheroma in the descending aorta, thoracic and abdominal; and (3) a distinct myo-hypertrophy of the wall of the left ventricle. The margins of the "foramen" ovale were unduly separated, and the superior curtain of the endocardial reflexion formed a large semilunar flap, manifestly capable of occluding the opening when the atria were not abnormally distended—that is to say, in the collapsed state of the heart after draining most of the blood from it—but when the atria were distended with fluid, or on stretching the septum widely with the fingers, a semicircular fenestra or opening some 8 to 10 mm. in diameter was exposed, permitting of ready communication between the atria. The atheroma of the aorta started beyond the aortic valve and surrounded the orifices of both coronary arteries, so that the inlets to each of these appeared distinctly narrowed though readily distensible. The atheromatous plaques as far as the arch were confluent, so that the whole aortic wall to the level of the arch was thickened, hard, inelastic, and appreciably, though not grossly, dilated. The change appeared to be strictly intimal, resembling the ordinary atheroma commonly seen in much older subjects. There was no medial change, and the appearances were not at all suggestive of syphilis. There was no sign of any coarctation of the aorta. Both coronary arteries were exposed carefully throughout, but these were innocent of any atheromatous change. The myocardium was of good colour and showed no evidence of ischaemic pathology. The pulmonary valve was not at all stenosed, and the wall of the pulmonary artery was healthy throughout. There was no patency or persistence of the ductus arteriosus. There was no perforation in the interventricular septum. All the heart valves were normally constructed and were devoid of any apparent pathological change. The valve curtains of the mitral valve exhibited no thickening or any undue rigidity; the chordae tendineae and papillary muscles revealed no malformation. The valve just admitted three fingers, and no more; we find at necropsy that many apparently "normal" hearts do. Only the wall of the left ventricle showed any degree of hypertrophy, and this was of moderate degree. The whole heart, emptied of blood, weighed 310 g. Blood collected from the heart, post mortem, gave a *negative* Kahn test result.

Respiratory System.—The lungs were comparatively dry and were air-filled throughout. There was no consolidation or oedema. The upper air-passages were clean, dry, and healthy looking.

Liver and Spleen.—These organs were not enlarged and showed no visible evidence of any chronic venous congestion. A frozen section of the liver revealed no fatty change.

Urinary System.—The kidneys were of average size. The parenchyma showed no appreciable pathological changes. The urinary bladder was healthy and contained a few ounces of clear straw-coloured urine.

Nothing abnormal was found in the examination of the brain. The pituitary, thyroid, and parathyroid glands, the adrenal bodies, prostate, and testes exhibited no pathological features. There was no enlargement of any of the regional lymphatic nodes. The osseous and muscular systems showed no obvious morbid change.

Histological Examinations.—These were restricted to the wall of the aorta, the liver, and one kidney. The aorta showed only intimal change, and there was no perivascular infiltration of the vasa vasorum such as to suggest any syphilitic aetiology. There was no microscopical evidence of chronic venous congestion of the liver. The renal parenchyma showed no degenerative changes, and there was no interstitial cellular infiltration.

Commentary

Clinically, the cause of death was manifestly syncopal, and at necropsy this appeared to be referable to the acute dilatation and engorgement of the right atrium. This atrial distension was strikingly greater than anything I have seen in cases of fatal syncope from other causes—in fact, in any other necropsy. It was considered highly probable that the distension was directly due in some way to the congenital persistence and patency (the latter, terminally) of the foramen ovale. The appearance of the specimen at necropsy suggested that physiological occlusion had been possible. There had been no prolonged decompensation or significant leakage through the defect, since there was no evidence of congestive sequelae of any chronic nature in the tissues or organs of the body generally.

The emphatic assurance given by the patient that his symptoms had developed suddenly, coupled with his demeanour, which was one of surprise and pique that such an absurd misfortune should have befallen him in the hour of his triumph, forced me to the conclusion that there was an immediate cause-and-effect relationship between the recent strain on the heart and its sudden failure. It may be that during the prolonged nervous excitement and physical activity of the naval action (at one phase the men had been at action stations continuously for sixty hours) there had been dilatation of the atrial defect and an unaccustomed or excessive leakage through that defect from left to right. In this case the atheromatous condition of the aorta may have contributed by increasing the load on the heart; possibly a terminal acute incompetence of the mitral valve may be the missing link in the chain of events. In this

respect the definite absence of any appreciable degree of pulmonary oedema is recalled.

Alternatively, it may be argued that the acute cardiac failure was due to coronary ischaemia, purely and simply. Certainly there was aortic atheroma here, and this involved the wall in the immediate vicinity of the orifices of the coronary artery. Similar cases of sudden death among soldiers in training during the recent war were usually ascribed to coronary ischaemia. If the present case was due to that cause then the extreme dilatation of the right atrium requires explanation. It is certainly an interesting and apparently insoluble pathological problem.

THE COUGH SYRUP

BY

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While syrups are commonly used as correctives for the disagreeable taste of medicines, there is probably no one group of drugs so consistently prescribed and dispensed in a syrupy vehicle as are expectorants and antitussives. Many drugs in this category could be prescribed as tablets, pills, capsules, etc., and any undesirable taste thus effectively dealt with; but they continue, for the most part, to be given in the form of a syrup. A good proportion of the syrups listed in the British and United States *Pharmacopoeias* contain drugs commonly held to be expectorant, while the number of non-official and patent cough syrups is legion. These considerations lead to the question of what, if any, are the pharmacological and therapeutic effects of syrups *per se* in the treatment of cough, and whether there is any justification for their continued use in cough medicines.

Historical

Why and when cough syrups were first used is a moot question in the investigation of which many interesting facts may be brought to light. Sugar, the basis of syrups, was first manufactured from the sugar-cane in Bengal, where it was called *sharkarā*, an old Sanskrit word which meant a substance made up of small grains (Flückiger and Hanbury, 1879). Etymologically the word *sharkarā* or *śarkarā* is the root of many modern words, such as sugar, sucrose, saccharin, syrup, sherbet, etc. From the Sanskrit the Persians changed the word to *shakar* and the Arabians to *sukkar*; in early Latin it became *saccharum*, and by mediaeval times had altered to *succarum*; from these words there was a gradual transition to the early French word *sukere*, then *sucre*, to the early English *sugre*, then *suger*, and finally to *sugar*. About the 8th century the cultivation and manufacture of sugar spread eastward from India to China, the Malay and the Pacific Islands, and westward through Persia to the Arabian Empire. Arabian physicians, especially Rhazes and Avicenna, are usually credited with introducing syrups into the therapeutic armamentarium. The word "syrup" is generally said to originate from an Arabic word, *sharab*, which meant a drink, but it is obvious that this Arabic word was derived from the more ancient Sanskrit source. It is interesting to note also that our word "candy" may be traced back to the Arabic word *kandat*, which meant a lump of sugar.

No evidence has been found that any one physician was responsible for the introduction of the cough syrup, and it seems most likely that the common people found, by trial and error, that sugar or syrups or candy held in the mouth would relieve a cough. In recent years Gordonoff (1935) has shown, using modern techniques, that the sucking of candy has a pharmacological effect upon the respiratory tract, which he interpreted as meaning an increased output of bronchial or respiratory-tract fluid. In a later extensive review of the physiology and pharmacology of expectorants Gordonoff (1938) has made the statement, without references, that sugars were ancient folk-remedies for colds. Should this be true—and it would appear to be correct from what evidence is available, or rather lack of evidence to the contrary—it is readily apparent how cough syrups were introduced into medical practice, because the early pharmacopoeias were, to a large extent, compilations of folk-remedies of earlier days. The retention of the cough syrup in subsequent editions of the pharmacopoeias and in the practice of medicine is readily understood when one looks over the list of drugs of disagreeable taste described in textbooks of materia medica and therapeutics of the last 200 years and even to-day—e.g., Beckman (1945).

Gordonoff (1935, 1938) claims to have proved that syrups do act as expectorants by augmenting the output of bronchial or respiratory-tract fluid. He noted that the duration of action is short, and hence advised giving syrups at intervals of about two hours. He also reported that maltose and sucrose, but not lactose, had expectorant properties.

Antitussive Action of Syrup in Man

Syrupus, *B.P.*, was given in doses of two teaspoonfuls t.i.d. or q.i.d. to 28 patients complaining of cough due, for the most part, to an attack of the common cold. I interviewed these people at short intervals, and recorded the results of "therapy" as effective or ineffective in relieving the cough. Where there was any doubt as to the syrup's having had an antitussive action the case was listed as ineffective. It should be mentioned that the patients did not know what medicine they were getting. Those who obtained relief from cough with syrup reported, on the average, that the antitussive effect lasted about two hours. In this small series of cases 68% got complete relief from cough, and in the remaining 32% there was little or no antitussive effect. Allowing for the subjective factor, which could not be controlled because a true control group was not possible, it seems reasonable to conclude that syrup alone actually did have some antitussive properties. In view of the fact, as will be described below, that syrup given by stomach tube to animals did not augment the output of respiratory-tract fluid, and in view of the short antitussive action of the syrup in man, it seems most reasonable to conclude that syrup taken by mouth exerted a linctus-like action by soothing the irritated pharynx and upper respiratory tract—irritation which presumably was responsible for cough in approximately two-thirds of the patients studied. The evidence from these experiments would favour the retention of syrup as a vehicle for expectorant and antitussive medicines. The results suggest that when an expectorant mixture is given in a syrupy vehicle the syrup exerts an immediate direct demulcent action, while in an hour or two the effective expectorant drugs in the mixture take over the same function but in a different way—namely, by augmenting the output of respiratory-tract fluid.

Syrups and the Output of Respiratory-tract Fluid

It was next investigated whether syrups alone have a true expectorant action, as claimed by Gordonoff. There is no unanimous agreement on the definition of an expectorant. Faced with this problem, when research on expectorants was begun a number of years ago in this department of the university, the decision was made to leave in abeyance the question of a definition and to investigate those pharmacological and therapeutic properties of reputed expectorants which might offer an explanation of their mode of action. Older methods for studying the nature of expectorant action were tried and discarded for one reason or another. The first new method used was to measure the water content of the tracheal, bronchial, and alveolar portions of the respiratory tract before, and at intervals after, administration of an expectorant drug. The technique was applied to a study of the creosotes and guaiacols (Boyd and Johnston, 1940; Connell, Johnston, and Boyd, 1940) and, while reasonably satisfactory, the procedure was cumbersome, time-consuming, and, more seriously, it did not provide the information most desired, so that it too was abandoned.

Gunn (1927) has stated: "If it were as easy to determine the quantity of bronchial secretions as it is to measure the amount of urine, there would be by this time no such vagueness in regard to the effect of expectorants as still exists." The problem, therefore, was to find a satisfactory method for quantitatively measuring the output of bronchial secretion or, as is used in this laboratory, respiratory-tract fluid (R.T.F.)—a term which does not designate the site of origin, at present imperfectly understood, of this fluid in the respiratory tract. Perry and Boyd (1941) eventually worked out a technique for determining the exact output of this fluid and of providing a means whereby

it could be collected and analysed. This method, with subsequent modifications, improvements, and variations (Boyd, Jackson, and Ronan, 1943; Boyd and Ronan, 1942; Boyd and MacLachlan, 1944; Boyd, Perry, and Stevens, 1944), consists essentially in collecting R.T.F. through a T-cannula ligated into the trachea of lightly anaesthetized or decerebrate animals, with the inhaled air warmed to body temperature and saturated with water vapour. By means of this technique it has to date been possible to measure the effect upon the output and composition of R.T.F. of the following drugs: ammonium chloride, ammonium carbonate, and thymol (Perry and Boyd, 1941); various guaiacols and creosotes (Stevens, Ronan, Sourkes, and Boyd, 1943); sympatheticomimetic amines (Boyd, Jackson, and Ronan, 1943); ether (Boyd and Munro, 1943); inhalation of ammonia (Boyd, MacLachlan, and Perry, 1944) and steam (Boyd, Perry, and Stevens, 1944); paregoric, camphor, benzoic acid, and alcohol (Boyd and MacLachlan, 1944); theophylline ethylenediamine, potassium citrate, and chloroform (Boyd, Palmer, and Pearson, 1946); ipecacuanha (Perry and Boyd, 1941; Boyd, Palmer, and Pearson, 1946); organic and inorganic iodides (Boyd, Blanchaer, *et al.*, 1945), volatile oils, balsams, terpene hydrate, and terebene (Boyd and Pearson, 1946); parasympatheticomimetic drugs and atropine sulphate (Boyd and Lapp, 1946; Lapp and Boyd, 1946; Boyd and Munro, 1943); sulphonamides (Boyd and Dorrance, 1946) and expectorant saponins and related drugs (Boyd and Palmer, 1946). Further studies are in progress.

In the investigation described here, the same technique was applied to a study of the effect of several pharmacopoeial syrups on the rate of output of R.T.F. in approximately 200 animals, including guinea-pigs, rabbits, and cats. The general procedure was to arrange the animals for collection of R.T.F., and at the end of three hours, when the rate of output had been at a plateau level for two hours, administer the respective syrup by stomach tube. The dosage ranged from 0.1 to 10 ml. per kilogramme body weight, and when the volume was below 10 ml. per kg. it was made up to that volume with water. In previous studies from this laboratory it has been repeatedly shown that water given by stomach tube in doses up to 10 ml. per kg. body weight has no effect upon the output of R.T.F. On the average, somewhat over twenty animals were used for each syrup given to each species. To standardize the presentation of results the mean output of R.T.F. per kg. body weight per hour was first determined for the two control hours immediately preceding the administration of the syrups. The mean output each hour afterwards was then found, and any increase in the rate of excretion expressed as a percentage of the initial control two-hour output. In calculating these means all values from all doses of syrups were included, since no syrup, with the possible exception of syrup of tolu, had any significant effect on the output of R.T.F. in any of the doses studied. The results thus determined are presented in the accompanying Table.

Table Showing Effect of Several Pharmacopoeial Syrups on Rate of Output of Respiratory-tract Fluid in Animals

Syrup	Species	Change in Output of R.T.F.			
		1st Hour	2nd Hour	3rd Hour	4th Hour
		%	%	%	%
Simple syrup ..	Rabbit	+6	0	−10	−15
Wild cherry	Cat	−13	−11	−16	+7
	Rabbit	−22	+16	+8	−22
	Guinea-pig	−24	−26	−20	−21
Squill	Cat	−18	−16	−14	−9
Liquorice ..	Rabbit	−2	+21	+18	+8
Tolu ..	Cat	+32	+33	+47	+37
	Rabbit	+93	+43	+28	+4
Ginger	,,	+10	+6	+28	+21

Syrupus, *B.P.*, syrupus pruni serotinae, *B.P.*, syrupus scillae, *B.P.*, syrupus zingiberis, *B.P.*, and syrupus glycyrrhizae, *U.S.P.*, had no significant effect on the rate of output of R.T.F., even in doses which would correspond to a pint (568 ml.) or quart (1.14 l.) taken by mouth by an average man, on a body-weight basis. Syrupus tolutanus, *B.P.*, slightly augmented the output of R.T.F. in cats and rabbits. From the results with this group of syrups it is apparent that the syrup in a cough syrup has little or no effect on the rate of output of R.T.F. when it is given by stomach tube.

Conclusions

From the results of these experiments on animals and man the following conclusions are indicated. First, the syrupy vehicle of a cough syrup exerts a short demulcent effect on the mucosa of the pharynx and upper respiratory tract, and if cough is due to irritation of this mucosa the syrup has an antitussive effect *per se*. Secondly, when the bulk of the volume of syrup enters the stomach it has little or no expectorant property in itself, in the sense that it does not increase the rate of output of soothing respiratory-tract fluid. Thirdly, effective expectorant drugs added to the syrup begin to exert an antitussive action, again in the sense that they increase the output of respiratory-tract fluid, at about the time that the local antitussive action of the syrup alone has begun to wear off. These experiments offer a logical explanation of the time-honoured use of expectorants in a vehicle of syrup, producing a cough syrup, and at the same time justify the continued use of this form of prescribing and medication.

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Medical Memoranda

An Accessory Liver in an African

While accessory spleens are commonly found at necropsy both in Europeans and in Africans, accessory livers are extremely rare. Rolleston and McNee (1929) were able to record only a very few cases, and in the literature available to me since their publication I have not been able to find reports of other cases. Thus this record of the occurrence of an accessory liver in an African may be of interest.

In the body of an adult male African of unknown tribe, dying of bronchopneumonia, a dark tumour, shaped like a fat cigar, about 3.5 by 1 cm. in its greatest dimensions, was found adherent to and partly embedded in the anterior surface of the pancreas at about the junction of the head and body, the longest axis being transverse. It was attached by a delicate pedicle which disappeared into the substance of the pancreas and, under the circumstances of the necropsy, was not traced further. The tumour was not attached to the liver. It was of darker colour than the true liver, which had no anatomical abnormalities.

Microscopically it proved to be hepatic tissue showing the normal liver architecture, enclosed in a delicate fibrous-tissue capsule with arteries, veins, and bile ducts running beneath the capsule, and these left the accessory liver at a small hilum and ran into the pancreas. Both the true liver and the accessory liver showed pathological changes, but these were much more pronounced in the accessory organ. They consisted of collections of fibroblasts and chronic inflammatory cells in the portal areas, with an increased amount of fibrous tissue surrounding and partially delimiting the periphery of some of the lobules. The rather dilated central veins were surrounded by liver cells containing considerable amounts of fat in large and small droplets, but the peripheral cells were free of fat. Considerably increased amounts of pigment were present—as granules in the Kupffer cells, in the sinusoids near the periphery as amorphous masses, and in the portal cell collections. All these changes were much more noticeable in the accessory liver.

Discussion

Most of the accessory livers recorded by Rolleston and McNee (1929) were attached to, or in close proximity to, the liver; mostly in the hepatic ligaments or directly attached to the liver or gall-bladder. One case is recorded by them of hepatic tissue in the omentum and scattered over the peritoneum; and one with a nodule of liver tissue in a suprarenal gland. None had such an attachment to the pancreas as was found in this case. They do, however, record the occurrence, reported by Mohamet, of an accessory liver attached to the tip of the gall-bladder in a case of cirrhosis; the accessory liver was also cirrhotic.

Permission to publish has been granted by the D.M.S., Uganda.

Mulago Hospital, Kampala. J. N. P. DAVIES, M.B., Ch.B.

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Persistent Vomiting in Infants treated by Continuous Nasal Drip-feeds

The difficulty of getting an infant suffering from severe and persistent vomiting to take enough food by ordinary means is well known. With a view to overcoming this difficulty I have in many cases during the past three years adopted the method of drip-feeding described below.

Technique

A small soft rubber catheter (size 4–6, according to the size of the infant) is lubricated and passed through one of the nostrils into the stomach. This is easily accomplished, with little discomfort to the infant. The free end of the catheter is attached to an ordinary blood transfusion set, the bottle of which contains the prescribed feed. The amount of milk mixture required by the infant is calculated for 24 hours, and this is run into the stomach by means of a slow drip. A rate of eight drops a minute will deliver 20 fl. oz. (568 ml.) in 24 hours. If a larger feed is required, the rate can be increased accordingly. The method is simple and can be easily mastered by trained nurses.

Before starting this regime of feeding the stomach is washed out and sufficient glucose saline (5%), or Hartmann's solution, is given by this method to combat dehydration. The actual feeding mixture will depend, naturally, on the requirements of the case concerned, and may consist of a milk mixture or a pure protein preparation, such as casein hydrolysate. Feeding in this way can be continued over a period of days until improvement occurs, when it is discontinued and normal feeding resumed.

Discussion

During the last three years I have used the above method of feeding for infants suffering from incessant intractable vomiting, for which no organic cause can be found, and for very weak wasted babies. In the first type of case the vomiting seemed to occur as a sequela to an attack of gastro-enteritis which had subsided, and may possibly have been due to a form of habit vomiting (Holt and MacIntosh, 1940). In weak malnourished infants the strain of having to be fed with small feeds at frequent intervals is exhausting, and it was regarded as far less tiring for the infant if it could be fed in a way unlikely to cause any such exhaustion. With this in mind the continuous-drip method was adopted. I have also used this method in other selected cases; notably, in infants suffering from rumination and in young children suffering from cyclical vomiting, during severe attacks. The chief advantage of this method is that the food requirement of the infant is maintained over a long period, without at any time overloading the stomach and so producing a recurrence of vomiting; and the patient is assured of adequate rest by not having to be disturbed at frequent intervals, as would occur if feeding by normal means were carried out. Where sedation by means of drugs is an essential part of the treatment, as in cases of rumination and habit vomiting, this is a very important consideration. I prefer this method to the usual form of oesophageal feeding of weak marasmic infants because it obviates the passing of a tube into the oesophagus several times a day.

I am very grateful to Dr. K. H. Tallerman, consulting paediatrician to the Essex County Council, for his help and encouragement in preparing this note, and to Dr. E. Miles, medical superintendent, for permission to publish it.

Oldchurch County Hospital, Romford. T. N. NAUTH-MISIR, M.B.

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Reviews

THE DOCTOR–PATIENT RELATIONSHIP

The Human Approach. A Book for Medical Students. By Henry Yellowlees, M.D., F.R.F.P.S., F.R.C.P., D.P.M. (Pp. 189. 10s. 6d.) London: J. and A. Churchill. 1946.

This is a book for which we have long been waiting. It may be described as a textbook of the doctor–patient relationship. Primarily intended for medical students, it would be read with great profit by all qualified doctors and not least by hospital physicians and surgeons and even psychiatrists themselves. It is possible that this volume will not help the student much in passing his examinations, but if he will learn, mark, and inwardly digest all the admirable common sense and enlightened appreciation of the other fellow's point of view which it contains, he will certainly be a much better doctor. He can do this not only with profit but with enjoyment too, for the style is delightfully humorous and the homely examples can be appreciated by those who are in no way versed in academic psychiatry. The book does not deal either with elementary psychology or psychiatry, but gives some simple explanations of psychopathology, a pathology from which none of us can escape since no one can be perfectly adjusted to life and everyone uses various devices to get round these maladjustments. It is with these devices that most of the book is concerned, but there are excellent chapters on the much discussed problem of rehabilitation, which must after all be primarily psychological, on the doctor's relation with the legal profession and his behaviour in court, on medical etiquette and ethics, and on the medical curriculum. A book to be thoroughly recommended.

MANAGEMENT OF VENEREAL DISEASES

Aids to the Diagnosis and Treatment of Venereal Diseases. By T. E. Osmond, M.B., M.R.C.S. (5s.) London: Baillière, Tindall and Cox. 1946.

Students and general practitioners and perhaps many specialists will welcome this work as giving in a very handy form (138 octavo pages) an account of the management of venereal diseases and of some others commonly dealt with by specialists in this branch of medicine. The author has had many years' experience in venereal diseases on both their clinical and laboratory sides, and during the late war was adviser on them to the Army.

Approximately 44 pages are devoted to gonorrhoea and 52 to syphilis, the remainder of the book containing accounts of soft chancre, granuloma venereum, lymphogranuloma inguinale, trichomonas infestation, non-specific urethritis, balanitis, and condylomata acuminata; serum tests; technical methods such as irrigation, staining by Gram's method, dark-ground microscopy, collection of specimens, and injections; prophylaxis; and the social aspects of venereal disease. The size of the work does not permit of an elaborate account of any of the above subjects, but sufficient has been given in most of those commonly met to enable the reader to deal with them. Indeed, the author is to be congratulated on having packed into such a small space and in such readable language so much useful information.

It is pleasant to find in this work so little that seems to call for criticism, but one of the few points which might be revised concerns the arrangement of some of the sections. One would think that diagnosis should follow symptoms; here it often precedes the latter. On page 58 the gonococcal fixation test is sandwiched between an account of the Kahn test and interpretation of the Kahn and Wassermann tests, and this is followed by a schematic presentation of these tests, the principles of which were described before the paragraph on the gonococcal test. On page 100 there is a little on serum diagnosis of congenital syphilis, yet on pages 101 and 102, under the principal heading of "Late Congenital Syphilis," subhead "Central Nervous System," there is more on serum diagnosis in the early weeks of life. Again, the treatment of congenital syphilis, into which the general treatment of syphilis is interpolated, would be more conveniently described in a single section.

THE INTIMATE STUDY OF BACTERIA

The Bacterial Cell in its Relation to Problems of Virulence, Immunity and Chemotherapy. By René J. Dubos. With an addendum by C. F. Robinow. Harvard University Monograph in Medicine and Public Health, No. 6. (Pp. 460; illustrated. $5.00 or 28s. 0d.) Massachusetts: Harvard University Press; London: Oxford University Press. 1945.

It has long been a reproach to the science of bacteriology that its study has been pursued only with limited ends in view—usually restricted to the apparent needs of one of its several branches. A more fundamental comprehension of bacterial behaviour, which in the end would serve the science in all its forms, has been neglected. But in recent years the depths reached even by *ad hoc* inquiry have vastly increased: progress in the study of immunity and chemotherapy have in particular demanded that we should know far more about the structure, chemical constitution, and metabolic behaviour of bacteria. It is mainly with these matters that Dr. René J. Dubos deals in *The Bacterial Cell*, a Harvard University monograph of the proportions of a full-sized book, and having a bibliography occupying 70 pages. Its main subjects are the structure of bacteria as revealed by direct observation, their physico-chemical properties, and in particular the mechanism of their staining, the analysis of their structure by means of enzymes and antigen-antibody reactions, variation, the nature of virulence, methods of immunization, and the mechanism of bacteriostatic and bactericidal action. These subjects are deeply involved in every advance for years past in the study of bacteria generally, and particularly in the therapy of microbic infections. The therapeutic success of the sulphonamides, and later of gramicidin and penicillin, has been largely responsible for the immense effort now directed at unravelling the secrets of bacterial metabolism, and now we have a fair understanding of how most antibacterial agents work, penicillin being the notable exception. An addendum to the text is a description by C. F. Robinow of the nuclear apparatus of rod-shaped bacteria as revealed by Feulgen staining; this is profusely illustrated, as indeed are other parts of the book which deal with morphology.

As a source of well-edited information on vital subjects, many aspects of which are not by any means generally familiar, and as a stimulus to thought and inquiry, this book will be valued by all progressive bacteriologists. The quotations which head each chapter are a delightful and sometimes humorous feature: their sources include not only the works of Pasteur and Ehrlich but the Bible and *Alice in Wonderland*.

AMPUTATION PROSTHESES

Amputation Prosthesis. Anatomic and Physiologic Considerations, with Principles of Alignment and Fitting Designed for the Surgeon and Limb Manufacturer. By Atha Thomas, M.D., F.A.C.S., and Chester C. Haddan. (Pp. 305; 207 illustrations. 50s.) Philadelphia and London: J. B. Lippincott Company.

A basic knowledge of the surgery of amputations, the specification and supply of suitable prostheses, the tuition of the disabled after limb-fitting, and complete rehabilitation of the patient are more necessary to-day than ever before. This applies not only to the surgeon deciding upon the exact operative procedure but to all who have any responsibility whatever, both for the supply and maintenance of the prostheses and the well-being of the patient. The preface of the book attempts to make this manifest. Many well-known books in various countries are mentioned as worthy of reference, among them being Muirhead Little's book written nearly twenty-five years ago. This is still a standard reference book and even now gives excellent guidance in surgery and the fitting of artificial limbs.

Mention is made of a tendency throughout history to exaggerate the values of prostheses, more especially artificial arms and hands. The success of any artificial limb, after it is correctly fitted, depends mainly upon the patient and the tuition given. The authors suggest that a limb-maker might be consulted before an amputation site is decided upon. This is surely a surgeon's sphere of work and it would be more satisfactory for the surgeon to have a knowledge of the types of limbs available or to consult another surgeon with this knowledge. Skin traction is treated at some length, especially in connexion with the guillotine operation. Surgeons in the British Army preferred to make flaps loosely sutured in the first place to allow for drainage. Only a very short summary is given of the important treatment of the stump by bandaging, and it is doubtful if it can be clearly understood. The illustrations show a thigh stump being bandaged by the patient standing erect; it is not possible for the patient to secure firm pressure in this way. The below-knee stump is shown being bandaged by another person; the patient can and should do this himself. Pylons are stated to cause "faulty habits of walking which may be difficult to overcome," but provided the patient has not used the pylon too long he can be taught to walk satisfactorily on an articulated limb and avoid the long use of crutches, which may induce "faulty habits."

The survey of the materials used in making prostheses is not sufficient to appeal to a limb-fitter, nor is it of great value to surgeons. The limbs illustrated are not typical of those used in this country. Better information would be obtained from a catalogue, such as those published by limb-making firms. One cannot agree that the mechanism of walking "is a perpetual falling and self recovery" as illustrated. The text and diagrams in this section need very cautious study. Many of the statements dealing with arm amputations and prostheses are debatable. A particular type of mechanical hand, copiously illustrated, shows tools held in the hand. It has been found here that better control of a tool or implement is obtained by the use of an appliance fitted to the artificial arm and interchangeable with the artificial hand. The tool is used for heavy work, and the hand for light work or cosmetic purposes. The cineplastic operation, with the special prosthesis, was tried on many patients some years ago in this country, and results were not satisfactory. It is pleasing to note the recommendation that children should be fitted in early childhood, as is the practice here. There is a good section on rehabilitation, though it is only a summary.

The book is very well produced, fully illustrated, and easy to read. One could not recommend it as a standard reference book for surgeons or advanced students in this country. The design of limbs varies so much in each country that a very comprehensive book would be required to cover the methods used in all countries.

Notes on Books

On Feb. 28 of this year Prof. J. Z. YOUNG, F.R.S., gave his inaugural lecture after appointment to the chair of anatomy at University College, London. The title of this thought-provoking address was *Patterns of Substance and Activity in the Nervous System*, and those who heard it as well as those not fortunate enough to be present will be glad to know that well-printed copies are now obtainable in pamphlet form from H. K. Lewis and Co., 136, Gower Street, W.C., price 1s. 6d. net. Prof. Young holds that for the progress of teaching and research in medicine what is needed is not a mere collaboration of anatomists and physiologists but to a considerable extent a fusion of the two. "To be able to understand and control living material, and in particular our own, we must regard it in various ways. We shall not make useful studies of the structure of the substance unless we bear in mind that it is continually changing, taking part in activities. Nor conversely can we profitably study the activities unless we remember that they are directed towards the conservation of the pattern. . . . This is tantamount to saying that anatomy and physiology cannot exist as separate sciences, and this indeed is my belief. Further, since each particular manifestation of organization has developed and in the end returns to the dust, all biology must also be historical and include the study of embryology and evolution. There is a real danger that if each of these sciences remains separate no one will be left to study the processes of conservation of the organism."

Experiments on the Presence of Carcinogenic Substances in Human Surroundings, by THEODORE VAN SCHELVEN (Amsterdam: Kosmos Publishing Company, Keizersgracht 133: $1.00), records an experiment in which benzene extracts of black crusts from bread and roast meat were painted on the skin of mice and induced a few tumours. The author suggests that carcinogenic hydrocarbons are produced at temperatures which cause blackening during roasting, baking or frying of food and that these substances may constitute an indispensable link in the chain of causal factors leading to "spontaneous" cancer in man. The alleged low incidence of cancer in certain populations (Eskimos and the Nubian Hadendowa) which lack fuel and therefore eat their food raw or lightly cooked is quoted in support of the hypothesis, and investigation of the tumour incidence in other populations with similar habits is urged. The argument is interesting but no more convincing than numerous other attempts to blame cancer on the habits of civilized man; ordinary civilized cookery should not produce charred food. The substance of the pamphlet is suitable for compression into an article for a medical journal but does not merit separate publication.

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YES OR NO?

The National Health Service Bill received the Royal Assent last week and is therefore now on the Statute Book as an Act. The appointed day for the Act is April 1, 1948. Between now and that date the medical profession will have to make up its mind collectively whether or not it is to take service under the Act, whatever may be the free decision of the individual doctor. If an effective majority of practising medical men in this country, after full consideration of what the Act means for both the public and the medical profession—for both individual patient and individual doctor—decide that the Act in operation will be in the best interests of neither, then the Minister of Health will fail to secure that co-operation of the medical profession which he has acknowledged to be essential if his measure is to be successfully carried through. This week every medical man and woman on the *Register* will receive from the British Medical Association three documents. The first is the plebiscite form on which each doctor is being asked to give the answer "Yes" or "No" to the following question: "Do you desire the Negotiating Committee to enter into discussions with the Minister on the Regulations authorized by the National Health Service Act?" The second is a report on the Act by the Negotiating Committee which summarizes the contents of the Act and examines them in relation to the principles laid down by the Negotiating Committee and endorsed by the medical profession as a whole. The third document is a brief letter from the Secretary of the B.M.A. which includes the decisions of the Representative Body on some of the more important issues in the Bill—as it was when these decisions were made. The latter two documents are printed in this week's *Supplement*. Elsewhere in the *Journal* we publish an abridged version of the White Paper on the Scottish Bill and an address on the Act given at Exeter last week by Dr. H. Guy Dain, Chairman of Council of the B.M.A.

It is well to state once more that the Negotiating Committee is made up of representatives of the B.M.A., the three Royal Colleges of England, the Royal Scottish Medical Corporations, the Society of Medical Officers of Health, and the Medical Women's Federation. It is, therefore, a committee wholly representative of the medical profession. The decision whether this Committee is to enter into discussions with the Minister of Health on the Regulations of the Act lies with the individual medical man and woman. Whatever answer may be given, the Negotiating Committee will plainly be in a weak position unless a large majority fill in the Plebiscite form and return it promptly to B.M.A. House. Surely at a time like this no medical man will shirk the responsibility of coming to his own decision on a matter which will not only affect him personally but which will have an equally profound effect upon the future of medicine. No man can afford to leave the decision in the hands of others. If everyone sends in his "Yes" or "No," then whatever the majority decision may be the Negotiating Committee will know that it can act in the full confidence that it has the solid backing of the profession in whatever course it has to pursue.

The answer "Yes" will empower the Negotiating Committee to discuss with the Minister the Regulations and Orders which will fill out what is to all intents and purposes an Enabling Act—Regulations dealing with such matters as the mode and amount of professional remuneration, terms and conditions of service, and the composition of Regional Hospital Boards. If, despite the divergences between the principles of the profession and the provisions of the Act, the profession chooses this course, then at the end of the discussions it will be able to have another look at the Act and to see how it will shape the doctor's daily work and conditions of living after April, 1948. In full possession of all the many and important details of the Regulations, and being able to assess their impact upon the status of the medical profession and upon the kind of service to be offered to the future patient, the doctors of this country will have to take the final decision whether or not to go into the Service prepared with a clear conscience to make it work. If discussions on Regulations are so unsatisfactory as to make the completed picture of the new National Health Service Act repellent to the medical mind, then the medical profession will be able to give a final "No" to the Minister of Health completely satisfied that it had withheld its answer until the intentions of the Minister were fully revealed.

This is one of the two alternatives with which the profession is now faced. What will be the position if the Negotiating Committee is instructed not to enter into discussions with the Minister on the Regulations and Orders of the National Health Service Act? The Minister, it is true, could proceed to make these Regulations and Orders with, presumably, the advice and assistance of the minority in favour of discussions. There can be no doubt, for example, that in this he would have the support of the Socialist Medical Association. He would, however, not have the indispensable support of the constituent bodies of the Negotiating Committee. The answer "No," backed by a substantial majority, would make the Act inoperable, and further legislation would be necessary to secure those principles the medical profession considers to be fundamental to its professional existence. But for the Negotiating Committee to be strongly armed in any conflict that might arise as a result of a negative answer the majority would have to be substantial and firm in its purpose. It is, of course, obvious that if the medical profession was so set against the Act that it felt unable to work under it such a decision would in no sense be illegal or in the nature of a strike. Doctors do not strike. They will always continue to serve the sick public. An Act is not necessary to make them do this. It would simply mean that they would not serve the sick public within the framework desired by the Government of this country. The Minister fully recognizes the right of the individual medical man not to enter the Service, so a decision not to enter into it would be strictly legal and honourable.

What factors are there in the present situation which might lead medical men to refuse to discuss with the Minister of Health the Regulations under the National Health Service Act? It has been said that economic factors will weigh heavily with medical men in the decision they arrive at. It is obvious that economic considerations must count with any man who has to earn his own living. We doubt, however, whether doctors generally would be misled by any favourable economic terms the Minister might propose as an inducement to enter the Service, for the simple reason that, as insurance practitioners know well, a Minister who can offer favourable terms in one year may in another year do the opposite. Nor do we think that medical men will sacrifice what they hold to be important principles for the sake of an immediate return in payment. These principles are set forth in the statement by the Negotiating Committee published in this week's *Supplement*, as well as an analysis of the divergence between the principles and the provisions of the Act. The essence of these principles is contained in the first: "The medical profession is, in the public interest, opposed to any form of service which leads directly or indirectly to the profession as a whole becoming full-time salaried servants of the State or local authorities."

In his speech at Exeter Dr. Dain stated his belief that the Act is part of the nationalization programme which is being steadily pursued by the Government. "What the Minister appears to have done," he observed, "is to have taken the Bill which we had partly fashioned and to have inserted into it the Socialist principles of State ownership of hospitals, direction of doctors, basic salary for doctors, and abolition of buying and selling of practices." Again he said: "We have attributed the importance of our professional position to the freedom we have to be employed by the patient and, in private practice, paid by him, or in insurance practice paid for him, but whether paid by or for the patient we have what is called free choice." Dr. Dain observed that neither the voluntary nor the municipal hospitals had put forward any definite or very strong opposition to the Bill, but it seemed to him that one of the earliest effects of the Act would be that the greater proportion of the consultants and specialists would become to all intents and purposes State servants. "We want," he concluded, "to put into the Act the right of every doctor to come in, and the right of appeal to the courts from the Minister's decision to take us out of the Service; we want removed from the Act the State ownership of hospitals, the embargo on the buying and selling of practices, all direction of general practitioners, and the salary element in general practitioners' remuneration; we want altered the procedure of election on to the councils and committees so that we may nominate our own representatives instead of the Minister choosing them all, and in that way we may curb dictatorship in the Service."

Dr. Dain stressed that "everybody should answer according to his views and his conscience the question framed in the plebiscite." He had been asked why the Association did not give a lead, and said that it was for the Council and for him to give the profession an understanding of the position and for the individual doctor to take the responsibility of decision. For that understanding we would urge everyone to read his speech, the summary of the National Health Service Act, the criticisms formulated by the Negotiating Committee under the heading of the "Profession and the Act," and the letter from the Secretary of the Association. What the profession instructs the Negotiating Committee to do will be faithfully carried out. The onus for determining what is to be done rests on each man and woman now practising medicine in this country.

PENICILLIN IN INTRAOCULAR INFECTIONS

The application of penicillin to external infections of the eye presented relatively simple problems, which have now been largely solved. The two time-honoured methods of treating the outer eye by drops and ointments are both used. Watery solutions have proved satisfactory, and of the various ointment bases the oculentum base of the *British Pharmacopoeia* (yellow soft paraffin 9 parts, wool fat 1 part) has proved better than many of the newer bases. The cold creams have been disappointing, because they are rapidly dissolved and because some of them tend to be irritating. Now that the imperative need for a buffered ointment base is recognized penicillin ointments have been widely adopted. The concentration of penicillin is a matter of importance, and in the more severe infections the maximum concentration that can be tolerated is generally employed: 2,500 units per ml. for drops and 800 to 1,000 units per g. for ointments. The frequency of application is also important. For example, in ophthalmia neonatorum the best results are obtained by prescribing drops at intervals of one minute for the first half-hour, every five minutes for another half-hour, and subsequently at longer intervals.[1] As for its range of efficacy in the external infections, penicillin is invaluable in purulent and muco-purulent conjunctivitis, in sepsis of the lids, styes, infected corneal ulcers, and to a lesser extent in blepharitis. The immediate results in blepharitis are generally good, but relapses are common, probably because sepsis is only one aspect of this condition. Promising preliminary results have also been obtained in the treatment of trachoma.

The use of penicillin in the intraocular infections presents many complexities. In the usual concentrations for drops and ointments penicillin does not penetrate into the interior of the eye. Intramuscular injection has also proved disappointing, as the drug does not reach the eye in a therapeutic concentration. Ionization presents clinical difficulties which have yet to be overcome, and subconjunctival injection is limited by the irritating effect on the eye of any large quantity of penicillin. In tolerated concentrations the amount reaching the interior of the eye seems to be low and therapeutically ineffective. Moreover subconjunctival injection cannot be repeated as frequently as the rapid excretion from the eye requires. A partial solution of these difficulties, particularly in the case of hypopyon ulcer, has been suggested by Juler,[2] who applies solid penicillin to the infected cornea. Many observers have advocated the introduction of penicillin directly into the anterior chamber and into the vitreous, but Von Sallmann, Meyer,

[1] *British Medical Journal*, 1945, **1**, 903.
[2] *Brit. J. Ophthal.*, 1946, **30**, 204.
[3] *Arch. Ophthal.*, Chicago, 1944, **32**, 179.
[4] *Brit. J. Ophthal.*, 1945, **29**, 511.
[5] Ibid., 1946, **30**, 134.

and Di Grandi,[3] Sorsby,[4] and Mann[5] have all found that the eye, and especially the vitreous, does not tolerate such injections.

For these reasons the place of penicillin in the treatment of intraocular infections remained ill-defined until the recent advent of pure penicillin and the application of massive doses of penicillin systemically. In 1944 Struble and Bellows[6] indicated that a concentration of 1 unit of penicillin per ml. of aqueous could be obtained in the dog by the injection of 12,800 units per kilogramme bodyweight. Town and Hunt[7] have recently confirmed the possibility of obtaining adequate therapeutic concentrations by massive injections of penicillin, and Town, Frisbe, and Wisda[8] have shown that experimental infections of the anterior chamber of the rabbit can be controlled by intraocular injections at 3-hourly intervals of 5,000 units of penicillin per kilogramme bodyweight. Further confirmation of the feasibility of controlling infections of the anterior chamber by the systemic administration of penicillin is recorded at page 723 of the current issue of the *Journal* by Sorsby and Ungar, who also obtained partial control of vitreous infections by this procedure. The data they give on the concentration reached in the aqueous of the rabbit after the injection of 25,000 units and of 50,000 units systemically indicate that though an adequate therapeutic level can be reached it is evanescent, persisting for not longer than three hours. When penicillin is given intramuscularly in beeswax there is longer maintenance of the concentration in the aqueous but at a lower level. It is possible that the administration of even more massive doses of penicillin intramuscularly may yield a higher concentration, but the work of Town and Hunt[7] suggests that this is unlikely. None the less the significant fact is that suitable therapeutic levels can be reached in the aqueous by systemic administration, and it remains only to establish optimum doses and adequate methods of giving the drug. As for the vitreous, Leopold[9] could not obtain any therapeutic concentration of penicillin by intramuscular and intravenous injections of massive doses of penicillin, nor could he control experimental infections of the vitreous by such treatment. Leopold, however, used only 4,000 units per kilogramme bodyweight, and the higher doses may explain the better results obtained by Sorsby and Ungar. That the control of vitreous infections is not satisfactory is perhaps only to be expected in view of the low vitreous concentrations that even the massive doses employed by Sorsby and Ungar produce. A further increase in dosage may perhaps overcome this limitation, but the outlook is not too promising.

The high degree of tolerance of the eye to pure penicillin makes it possible to inject subconjunctivally at frequent intervals quantities massive enough to reach concentrations in the aqueous which are many times higher than the necessary therapeutic level. These high levels are, moreover, maintained for longer than the lower levels following massive systemic administration. The experimental and clinical results recorded by Sorsby and Ungar show the efficacy of this procedure. Even in desperate cases subconjunctival penicillin was not unsatisfactory; in these circumstances a clinically satisfactory result in three out of eight post-operative infections is more significant than the two total losses. Their results in vitreous infections were less satisfactory. A total loss of two eyes was to some extent balanced by a partial control in a third eye, and rather more than a partial control in a fourth eye. It is possible, of course, that the trauma of an intraocular foreign body contributed to the total loss of two out of three eyes with such an injury, but these clinical results and the experimental findings emphasize the gravity of a vitreous infection. Experimentally subconjunctival injections gave adequate control, while other methods were not so satisfactory. In man, however, subconjunctival injections may not be quite adequate, and the possibilities of pure penicillin injected into the vitreous require further exploration. Like other workers, Roenne[10] found that only the direct introduction of penicillin into the vitreous would control an experimental infection. The disadvantage of this procedure is the intolerance of the vitreous to such intervention. Von Sallmann and his associates[3] advocated a dosage not exceeding 100 units; Leopold,[9] on the other hand, found 1,000 units necessary for adequate control. Roenne believes that an injection into the vitreous of up to 500 units is harmless. These observers all used penicillin containing unknown amounts of impurities. That the impurities are responsible for the intolerance of the eye to injections has been suggested by Mann[5] and seems to be proved by Sorsby and Ungar's finding that the rabbit's eye will tolerate 5,000 units of pure penicillin injected into the vitreous. The control of intraocular infection, and particularly of infections of the vitreous, would seem to lie, therefore, in a judicious blend of massive systemic therapy, with pure penicillin subconjunctivally, and perhaps also direct injection into the vitreous.

6 *J. Amer. med. Ass.*, 1944, **125**, 685.
7 *Amer. J. Ophthal.*, 1946, **29**, 171.
8 Ibid., 1946, **29**, 341.
9 *Arch. Ophthal.*, Chicago, 1945, **33**, 211.

WARTIME MENTAL HEALTH

The annual report of the Board of Control for 1945 is the first to be published since the outbreak of war and is largely occupied with a retrospect of the war years.[11] It is also the first to be issued under the chairmanship of Mr. Percy Barter, a former secretary of the Board, and it contains a tribute to the work of Sir Laurence Brock, who was its chairman for seventeen years.

In the autumn of 1939 some 25,000 beds were placed at the disposal of the Services and the E.M.S. Four mental hospitals and two colonies for mental defectives were completely evacuated within twenty-four hours, and in twenty other institutions space was released by the transfer of patients. Air raids caused damage and disorganization to over a hundred institutions, and altogether 252 members of the medical staff left for war service. All these disturbances had very little effect upon the death rate in mental hospitals, which was much below that obtaining during the previous world war, though conditions then were not so abnormal. In 1941 the death rate was 33% higher than the pre-war level, but it fell again slowly, until in 1945 the rate was slightly below that for the last pre-war five-year

10 *Brit. J. Ophthal.*, 1946, **30**, 405.
11 *The Thirty-second Annual Report of the Board of Control for the Year 1945.* Part I. London: H.M. Stationery Office. 1s. net.

average. In 1938 the proportion of deaths to the average number of patients resident in mental hospitals was 66.7 per 1,000, but in 1945 it was only 68.4 per 1,000 notwithstanding the difficulties of the war years. During 1918 the corresponding figure was 203 per 1,000. Details of the 1945 deaths could not be included in the report, but in 1944 the principal causes of death in mental hospitals were diseases of the myocardium, pneumonia, senility, and pulmonary tuberculosis, in that order. Of 8,774 deaths, 113 were due to violence, including suicide, and 363 to general paralysis of the insane. The death rate from tuberculosis was somewhat above the pre-war level.

Admissions to public mental hospitals are governed to some extent by the accommodation available, the facilities provided at different hospitals, and the extent to which out-patient work is developed. They are also influenced by quite external factors, and although it is true that during the war the general community was subjected to abnormal strains which might have predisposed to mental disorder, on the other hand there was full employment and a relatively high standard of living. Admissions in the earlier war years were lower than the average for the pre-war quinquennium. They rose above this average in 1943 and continued to rise for the next two years. The total number of persons under care during 1945 under the Lunacy and Mental Treatment Acts was 146,027 (62,512 males and 83,515 females). There were 33,961 direct admissions, just over half of which were voluntary, and the discharges were equal to 71.7% of the direct admissions. They included 11,271 discharged "recovered" and 10,128 "relieved," as well as 2,801 "not improved." Of those remaining, 130,047 were certified, 15,565 voluntary, and 415 temporary patients.

The number of mental defectives reported to local authorities during the years immediately before the war showed a continuous increase. Between 1930 and 1940 the total reported rose from below 2.0 to over 3.0 per 1,000 population, and those ascertained as "subject to be dealt with" from 1.17 to 2.39. The rise was checked on the outbreak of war but was eventually resumed. The transient fall was due to shortage of staff, transport difficulties, evacuation, lack of beds in certain institutions, and a labour market which enabled defectives who had never before earned their living to become self-supporting. There were 51,768 defectives under statutory care in 1945 and 23,862 under voluntary supervision. The variation in the number of mental defectives reported in different areas is probably not so much a guide to the local incidence of mental deficiency as a pointer to the alertness of the authorities. For example, in one county borough 8.48 per 1,000 of the population were reported, and in another only 1.37. In one Yorkshire county borough the figure was 4.73 and in another only 1.71. There are great differences also between the numbers reported and the numbers ascertained as "subject to be dealt with." In some areas all those reported were apparently "ascertained": in others only half or less than half.

In dealing with reconstruction the report emphasizes the need for substantial reinforcement of the medical personnel of the mental health services. The war has naturally focused attention on the psychiatric needs of Service men and women, and this in turn has quickened appreciation of the needs of the civilian community. Since the passing of the Mental Treatment Act in 1930 the number of out-patient clinics has increased greatly, but it is apparent that many more are required, and that mental health work is hindered by lack of staff and of proper accommodation.

"With the recognition of the potential importance of these clinics to the mental health of the community and to the efficiency and well-being of the individual the time seems ripe for their rapid expansion so that they can be organized to carry out the wide range of work now regarded as their function. . . . Briefly, the functions of an out-patient clinic are to accept for consideration persons referred for psychiatric help, to diagnose the psychiatric disorder, to arrange proper in-patient or out-patient treatment, and to interpret the disorder to persons or agencies who must co-operate in treatment. To achieve this there will be required an adequate staff of psychiatrists, psychologists, social workers, and clerical assistants. If the clinic is to be an all-purpose one there will need to be specialization within it to deal efficiently with the various aspects of the work, such as child psychiatry, court work, industrial problems, vocational guidance, teaching and propaganda, and research."

The most important aspect of reconstruction in the mental health service and one with which the Board of Control is now preoccupied is its organization as an integral part of the National Health Service. The Board is considering the rewriting of the Lunacy Code, the recasting and simplification of which is urgently necessary in view of the many and far-reaching modifications which the new health legislation effects in the Lunacy and Mental Treatment Acts and in the Mental Deficiency Acts.

THE MINISTER OF MILK

The Minister of Food recently issued a statement to the medical press on priority milk for invalids.[1] He stated that during the war the amount so allocated remained about 900,000 gallons weekly. By December, 1945, it had risen to 1,200,000 gallons, and since then to 1,300,000 gallons weekly. The Minister concluded that as there was no evidence for a 44% increase in invalidism the rise in consumption of "priority milk" must be because of "less strict" medical certification. The Minister then consulted the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council on how to effect economy in the consumption of milk. The M.R.C. Committee appears to have accepted the Minister's view that the increased consumption of "priority milk" is the result of "less strict" certification, because it has advised him that "when the medical profession had been informed of the present situation of the country's milk supplies they would endeavour to effect the necessary economies." The M.R.C. Committee is composed of men able to assess facts in a scientific manner. It is therefore surprising that they should appear to have accepted the Minister's assumption without sifting the evidence. Not one of the members of the M.R.C. Committee is in general practice and therefore with direct experience of the matter they were called upon to judge. The Minister plainly felt in need of scientific backing for what he must have known was a thoroughly unscientific approach. He can have no more grounds for believing that there has not been a 44% increase in invalidism than for concluding that medical certification for milk has become less strict. There are many other factors to be considered, not least among them being the demobilization of 4,000,000 persons from the Forces. The incidence of gastro-intestinal disturbances in

[1] *British Medical Journal*, 1946, **2**, 661.

the Forces has been a subject for continued comment since 1939. It is clear, in fact, that the Minister of Food finds the medical profession a convenient scapegoat, and it is significant that, knowing the weakness of his case, he made no attempt to consult the B.M.A., the one body which would have been in a position to put him in possession of the facts. At its meeting last week the Council of the B.M.A. took the strongest exception to the Minister's methods and hasty and ill-judged conclusions.

SILICOSIS AND METALLIFEROUS MINING IN ENGLAND

The decennial supplement of the Registrar General reveals that the occupation with the highest standardized mortality ratio (registered deaths expressed as a percentage of the calculated or expected number of deaths in any particular occupation) among males aged 20–65 is "tin and copper mining below ground," with a ratio of 342; the third highest is "other metalliferous mining below ground," 283; and the fifth is slate mining and quarrying, with 168. An account of tin-mining practice in relation to silicosis by Hale[1] which appears in the June number of *Thorax* is therefore of great importance and interest. He explains how the metalliferous lodes in Cornwall are related to the killas (slate) and to the granite, how the shaft is sunk, and how the ore is removed. In the period 1932 to 1944 one hundred and thirty men were certified as suffering from silicosis, and received compensation. This silicosis conforms more to the classical type than that occurring in South Wales. The miners are exposed to pure quartz, as opposed to a mixture of quartz, mica, clay, coal, and other substances. The lungs present a generalized fibrosis with miliary collagenous fibrous nodulation, and later considerable emphysema with pleural adhesions develops. The skiagraphic appearance is that of reticulation, often starting in the second interspace and going on to nodulation; massive shadows are not as common as in the South Wales coal miners, and appear to be related to reticulation rather than to nodulation. The development of the disease is insidious, but the onset of symptoms is often abrupt, disabling dyspnoea arising in a period of weeks. There may be no evidence of a superadded infection, though its eventual occurrence is the rule; it is sometimes tuberculous and sometimes non-tuberculous. The immediate cause of death is often congestive heart failure or bronchopneumonia.

In all industrial disease the most important thing is prevention; in this case that means the suppression of dust; and great advances have been made by engineers in the invention of drills towards the achievement of this end. Cornwall has made a great contribution, and Cornish tin mining, besides producing valuable raw material, has inspired the Camborne School of Mines to become one of the most famous schools of mining engineers in the world, and Camborne itself to become the centre of the world's rock-drill industry. Treve Holman[2] has written a historical review of the methods of extracting rock and their relation to silicosis, and he has pointed out that the invention by Leyner in 1902 of the hollow drill, through which a current of water passed, is one of the most valuable aids to preventive and industrial medicine of our time. The latest inventions, which include the tungsten-carbide cutting tip and the apparatus which prevents the drill working without the water's being turned on, may prove to be so effective that silicosis will no longer occur in British mines.

Since it takes an average of ten years for silicosis to develop, at least that time must elapse for us to know for certain the success that has been achieved by this excellent work; and medical supervision is required during that period for assessment of the results. During the past fifteen years medical supervision under the direction of Craw[3] has been carried out in the haematite miners in Cumberland with very great success; in fact, he claims that no miner who has entered the mines in that period has developed any signs of dust disease of the lungs. This has been achieved by careful selection of the men allowed to enter the mines and their repeated examination and routine chest skiagraphy, which among other things ensures that early cases of tuberculosis are identified and removed. The presence of the tuberculous in metalliferous mines has certainly in the past been a very serious matter. Tuberculosis, inextricably bound up with silicosis and often the cause of the abrupt onset of symptoms, is undoubtedly one of the factors predisposing to the development of that disease, which itself favours the development of tuberculosis.

[1] *Thorax*, 1946, **1**, 71.
[2] *Brit. J. industr. Med.*, 1947, **4**, 1 (in the press).

PNEUMONECTOMY IN BABY OF THREE WEEKS

Pneumonectomy has now become a standard operation in thoracic surgery, but the occasions when it is needed in very young children are few, and in infants it is an unusually rare procedure. For this reason the recent report by Gross[4] of a case of successful pneumonectomy in an infant aged 3 weeks and weighing only 6 lb. 4 oz. (2.8 kg.) is of great interest. It would appear to be the youngest case of pneumonectomy on record.

The baby's breathing was noticed to be abnormal and laboured on the fourth day of life, and during the following days the symptoms gradually increased in severity until dyspnoea became pronounced and cyanosis appeared. The child was admitted to hospital, and skiagraphy revealed a large air-containing tension cyst in the substance of the left lung causing gross mediastinal displacement and compression of the left lung. Operation was decided upon, as it was considered that needling to relieve tension would be of only temporary benefit and might lead to further complications. Pneumonectomy was performed easily by dissection of the individual vessels and the bronchus; in addition to the large cyst several smaller cysts were present. The child made a rapid recovery, and at the age of 6 months weighed 15 lb. (6.75 kg.) and seemed perfectly healthy and normally developed.

A large congenital cyst in the lung at this age is usually fatal, and most cases have been recorded post mortem. Gross is therefore to be congratulated both on his courage in attempting such a formidable operation at this tender age and on the excellent result obtained. It is especially interesting to know that the operation was so well tolerated.

The case is also of interest as an example of true congenital cystic disease of the lung. A histological description is given. Gross quite correctly points out that in many cases, and especially in older patients, it is often difficult or impossible to know whether one is dealing with a true congenital cyst which has become infected or with a condition of bullous cystic disease following upon an infective process in the lung with scarring. Many, however, would not agree with him in his statement that a lining membrane composed of bronchial epithelium, the individual cells of which are ciliated, columnar, and mucus-secreting, positively identifies a cyst as being congenital in origin. True columnar ciliated epithelium of bronchial type can undoubtedly grow into and form a lining of a chronic lung abscess, thus closely mimicking a congenital cyst. In many such cases differentiation from congenital cystic disease is certain on the clinical features and on serial skiagraphy.

[3] Ibid., 1947, **4** (in the press).
[4] *Ann. Surg.*, 1946, **123**, 229.

NATIONAL HEALTH BILL FOR SCOTLAND

THE PROPOSED NEW SERVICE

The National Health Service (Scotland) Bill was published on Nov. 6 together with a White Paper[1] outlining the proposed new service. The notes that follow are abstracted from the White Paper. It reveals some differences between the Scottish Bill and the English Act, which received the Royal Assent last week.

The Bill provides for the establishment of a comprehensive health service in Scotland. It does not deal in detail with everything involved in the service. It deals with the main structure. Within that structure, further provision will be made by statutory regulations—on lines which the Bill lays down and subject always to the control of Parliament. All the service, or any part of it, is to be available to everyone in Scotland. The Bill imposes no limitations on availability—e.g., limitations based on financial means, age, sex, employment or vocation, area of residence, or insurance qualification.

The service is to be available from a date to be declared by Order in Council under the Bill, probably early in 1948, as for the corresponding service in England and Wales.

The health service is to be financed partly from the exchequer, partly from local rates, partly from the help which part of the National Insurance contributions will give. There are to be no fees or charges to the patient, with the following exceptions: (i) some charges for the renewal or repair of spectacles, dentures, and other appliances, where this is made necessary through negligence; (ii) charges for the provision of domestic help under the Bill and for certain goods or articles in connexion with maternity and child welfare or the special care or after-care of the sick; (iii) payment for additional amenities within the service—e.g., charges for private rooms in hospitals.

General Organization

The Bill places a general duty upon the Secretary of State to promote a comprehensive health service. To bring physical and mental health closer together in a single service, it places the administration of the mental health services under the Secretary of State in the same way as the physical health services, while leaving undisturbed the functions of the General Board of Control for Scotland in regard to the liberty of the subject and the interests of the individual.

For parts of the service organized on a new national or regional basis—i.e., hospital and specialist services, ambulance services, blood transfusion, and bacteriological laboratories for the control of epidemics—the Secretary of State is to assume direct responsibility; but he is to entrust the actual administration of the hospital and allied services to new regional and local bodies established under the Bill. These bodies are to act on his behalf in suitable areas, and they are to include people of practical experience and local knowledge and some with professional qualifications. Special provision is made for the medical and dental teaching which is carried on in connexion with those services. The Secretary of State is also to undertake the provision of the new health centres; but he is empowered to delegate this function to the major local authorities.

For parts of the service organized as a function of local government—i.e., a variety of local domiciliary and clinic services—direct responsibility is put upon the major local authorities, the county councils and town councils of large burghs. They will stand in their ordinary constitutional relationship with the central Department, but their general arrangements for these local services are made subject to the Secretary of State's approval.

For the personal practitioner services both in the health centres and outside—i.e., the family doctor and dentist and the pharmacist—new local executive machinery is created in the form of local executive councils. One half of the members of each of these councils will consist of people nominated by the major local authorities and by the Secretary of State, and the other half of people nominated by the local professional practitioners concerned. There will normally be an executive council for each of the counties and of the four largest cities, and they will work within national regulations made by the Secretary of State.

To provide professional and technical guidance, there is to be set up a Scottish Health Services Council. This will include people chosen from all the main fields of experience within the service—with various standing committees of experts on particular subjects, medical, dental, nursing, and others.

Hospital Administration and Endowments

The existing premises and equipment of voluntary and public hospitals are transferred to the Secretary of State under the Bill, and he is empowered also to acquire by purchase—if necessary—other hospitals and their equipment which may be required for the purposes of the new service. If in any particular case he is satisfied that the transfer of a hospital is not in fact necessary for the new service he can—with that institution's concurrence—except it from transfer. The general transfer of hospitals includes the present mental hospitals and mental deficiency institutions.

The Bill requires the Secretary of State to entrust the administration of the hospital and specialist services to a specially created regional and local organization. Regional hospital boards are to be set up to act as agents of the Secretary of State for the general administration of hospital and specialist services in their areas. Five such boards are envisaged in Scotland. In turn, to act as agents of the regional hospital boards for the control and management of particular hospitals, boards of management are to be set up, one for each large hospital or for each group of hospitals forming a convenient unit.

The area of each regional board is to be fixed by the Secretary of State in an order subject to Parliamentary review. So far as practicable each area is to be such that the provision of hospital and specialist services in the area can conveniently be associated with a university medical school. Each regional board will be composed of people chosen by the Secretary of State for their individual suitability for the task, but before making the appointments the Secretary of State is to consult any university with which the hospital services in the area are associated, bodies representative of the medical profession, the local health authorities of the area, and others concerned, including initially those with experience of the voluntary hospital system. The boards are to include some members with experience of the mental health services.

Boards of management are to be appointed by the regional hospital board, in accordance with a scheme drawn up by the regional board in consultation with the university, and approved by the Secretary of State. The scheme will specify the hospitals which are to provide facilities for medical teaching and also the hospitals which are to be grouped for the appointment of a board of management. Each board of management is to include members appointed after consultation with the local health authorities of its area, with the executive councils for general practitioner services in its area, with the senior medical and dental staff of the hospitals concerned, and with the governing bodies of any voluntary hospitals that are to come under the board. Where a hospital provides medical teaching facilities, the board of management will include university and teaching staff nominees.

Subject to general regulations and any particular directions the Secretary of State may give, the regional organization of the service will be undertaken by the regional board itself. Within that framework each board of management will be left as free as possible in the actual running of their hospital. For example, although all persons employed at the hospitals will be technically employees of the regional boards, boards of management will in fact choose, appoint, and dismiss all staff except certain senior officers; subject to bulk supply arrangements in appropriate cases they will have discretion in the purchase of equipment and supplies; and they will be responsible for maintenance work or improvements at the hospitals, short of major extensions or works involving a change of the hospitals' functions in the regional service. They will be able to set up committees for particular purposes.

[1] Cmd. 6946. H.M. Stationery Office, Edinburgh. Price 4d.

including house committees for individual hospitals where a group is within their care.

It is intended that the regional boards and the boards of management shall enjoy a high degree of independence and autonomy within their own fields. For the general financing of their hospital services they will look to the exchequer, and they will be given as much financial freedom—by a system of block annual budgets or otherwise—for local initiative and variety of enterprise as general principles of exchequer responsibility make possible. They will also have independent control of the endowment funds entrusted to them. The endowments of each voluntary hospital transferred to the Secretary of State—defined in the Bill to mean, broadly, all its property other than buildings and their contents—will pass, in the first place, to the board of management responsible for the hospital or group of hospitals in which it is included, and the board will hold them in trust exactly as they were held before. The Secretary of State, however, may make regulations providing for some of the property comprised in endowments to be used to discharge liabilities transferred to him from the voluntary hospitals.

The Secretary of State is then required to set up a Hospital Endowments Commission, to operate initially for a period of five years. Its powers may be continued for further periods, and when they finally lapse the Secretary of State may thereafter exercise like powers himself. The Commission is given the duty of reviewing all endowments and making schemes for their future management and application, including in appropriate cases the transfer of endowments from the board of management which received them in the first place to another board of management or a regional board. Schemes may specify a particular purpose for which endowments are to be used, or may enable the board to which they are given to use them for any purpose relating to hospital or specialist services or to research that the board chooses. In making the schemes the Commission is to take into account the spirit of the intention of the founder of the endowment, the extent to which its original purpose is now otherwise fulfilled, and the interests of the hospital service generally.

In addition, regional hospital boards and boards of management are also enabled, under the Bill, to receive gifts or legacies and to hold any property on trust for any purpose relating to hospital or specialist services or research. Such acquisitions are not subject to review by the Commission.

Hospital Staffs

Specialists taking part in the service, whole-time or part-time, will be attached to the staff of hospitals. Part-time participation in the service will not debar the specialists from also continuing any private practice outside the service which individual patients may wish them to undertake. Special provision is to be made by regulations affecting the appointment of senior medical and dental staff employed on the staff of hospitals. In these cases the vacancy is to be advertised, and an advisory appointments committee is to be set up for each occasion. This committee will consist of nominees of the regional board and boards of management concerned; in the case of a specialist appointment, specialists nominated from a national Scottish panel maintained for this purpose; and, in the case of an appointment where the holder is also to have teaching duties, nominees of any university concerned. The committee will select suitable applicants and the appointment will be made from this selection.

The regional boards, or in appropriate cases the boards of management as their agents, will determine the terms of engagement of any staff employed in the hospital service. The Secretary of State, however, is empowered to make regulations governing the qualifications, conditions of service, and remuneration of any or all classes of hospital staff—as of the staff engaged in any other part of the health service. Before making regulations he will consult any appropriate organizations representing the staffs concerned, and it is his intention—wherever appropriate—to use existing, or set up new, negotiating machinery to facilitate those consultations. Existing hospital officers employed on a paid whole-time basis are to be protected, either by being transferred to the new bodies or by compensation if they are not transferred or are re-employed on less favourable terms than before.

The promotion of research, the provision of ambulances, of a blood transfusion service, and of a laboratory service are functions which will for the most part be devolved upon regional hospital boards and boards of management. It is intended to make the fullest use of the motor ambulance service recently set up by the St. Andrew's Ambulance Association and the Scottish Branch of the British Red Cross Society, and also of air ambulance services. The transfusion service in Scotland is at present run by the Scottish National Blood Transfusion Association, and it is intended that this arrangement should continue. The Secretary of State is expressly empowered to provide a bacteriological service, including the provision of laboratories, for the control of infectious disease. This service will be at the disposal of the local health authorities in the discharge of their epidemiological functions.

Medical Education

The Bill leaves untouched existing responsibilities for medical education. But a vital part of medical education is carried out in hospitals, and the Bill therefore places a specific duty on the Secretary of State to make available for this purpose such facilities as he considers necessary to meet all reasonable requirements. Access to facilities for the conduct of research is also essential for the work of a medical school, and a similar duty to provide research facilities is placed upon the Secretary of State. These duties will devolve upon regional boards and boards of management. Every board of management administering a hospital used for medical teaching will include members nominated by the university concerned and by the teaching staff at the hospital; in the case of an important teaching hospital each of these groups may form one-fifth of the total membership. Every regional hospital board will also include members appointed after consultation with the university or universities concerned.

In addition there is to be a Medical Education Committee in each region, to advise the regional board on the administration of hospital and specialist services in the area so far as the provision of facilities for medical education or for research is concerned. This Committee will consist of members appointed by the universities concerned, with an equal number appointed by the regional board; and representatives of other bodies such as the Royal Medical Corporations will also be included where appropriate. Where an officer appointed by the hospital organization for hospital work is also to hold a teaching appointment from the university, the Bill provides that the advisory appointments committee set up in connexion with the hospital appointment is to include a representative of the university.

General Practitioner Services

To arrange these personal health services locally new bodies—to be called executive councils—are to be established. There will be separate councils for the four largest cities and for most of the counties, but some of the counties with smaller populations may be combined for this purpose. Each council is to be so composed that one half of its members are professional—appointed by the local doctors, dentists and pharmacists through their own representative committees in the area—while the other half of the members are to be appointed partly by the local authorities in the area (one third of the executive council) and partly by the Secretary of State (one sixth). The chairman will be appointed by the Secretary of State.

A feature of the personal practitioner services is to be the development of health centres. The health centre system, based on premises technically equipped and staffed at public cost, should afford facilities both for the general medical and dental services and also for many of the special clinic services of the local health authorities, and sometimes also for out-post clinics of the hospital and specialist services. Besides forming a base for these services—e.g., providing doctors on suitable terms with equipped and staffed consulting-rooms in which to see their patients—the centres will also be able to serve as bases for various activities in health education. The Bill makes it the duty of the Secretary of State to provide, equip, staff and maintain the new health centres. He is empowered to delegate this function wholly or partly to local health authorities, but it is not intended to exercise this power widely in the early years of the new service.

Doctors and dentists who use the new centres while participating in the general personal practitioner service will be in contract only with the new executive councils, and those councils in turn will arrange with the Secretary of State for the use of the centres' facilities by those doctors and dentists. In the case, for instance, of doctors in the general practitioner service the centres will in effect stand in place of the doctors' own surgeries; and the doctors' responsibilities to their patients on their personal lists—e.g., in visiting their patients' homes and in general responsibility for their patients at all times—will be the same whether a doctor practises from a health centre or not.

All doctors are to be entitled to take part in the new arrangements in the areas where they are already practising when the scheme begins. Taking part will not debar them from also continuing to make private arrangements for treating such people as still wish to be treated outside the service instead of taking advantage of the new arrangements, provided that such persons are not on their lists as public patients or on the lists of their partners in a health centre. People will be free to choose their own doctor (including their present doctor if he takes part in the service) subject to the doctor's consenting and being in a position to undertake their care.

All doctors taking part in this part of the new service will be in contract with the executive council for the area in which they practise. The executive council will be required to draw up and publish lists of all general practitioners who are participating. People will then choose their doctor and each doctor will have his own list of the people whom he has agreed to attend. There will be machinery for allocating among the doctors concerned such people as wish to take advantage of the service but have not chosen a doctor for themselves or have been refused by the doctor chosen by them. The relationship of the doctor with any person on his list—i.e., his functions under this part of the service—will then be similar to the ordinary relationship of doctor to patient as it is now known, except that the doctor's remuneration will come from public funds and not directly from the patient.

The Bill itself does not determine the detailed terms and conditions for doctors joining in the service or the doctors' remuneration. These are left to be settled by regulations, and the necessary regulations will be made in consultation with the doctors' professional representatives. It is, however, the intention that remuneration should take the form of a combination of fixed part-salary and of capitation fees. Variations of the fixed part-salary will be possible so as to take account of different circumstances and experience and the differing conditions of practice in particular areas. Supervision allowances can be provided for practices where assistants are employed. It is intended also to institute, under powers contained in the Bill, a contributory superannuation scheme for doctors taking part in the new arrangements.

Actual rates of remuneration for doctors will be determined, in consultation with the profession, in the light of the report received from the Spens Committee. The substance of the Committee's majority recommendations has been accepted by the Government.

Distribution and Sale of Medical Practices

To help in dealing with the needs of under-doctored areas it is intended to adjust the scales of remuneration of doctors so as to provide additional inducement to practise in less attractive areas. In addition, a new body to be called the Scottish Medical Practices Committee, mainly professional in composition, is to be appointed under the Bill to regulate in future the succession to old, or the opening of new, practices within the service. To begin with, an appointed day will be fixed and all doctors then in practice will have the right to have their names included in the lists drawn up by the executive councils for the areas in which their existing practices are. After the appointed day any doctor who wishes either to join the public service for the first time or, if he is already in it, to go and practise in a new area will need to obtain the consent of the Medical Practices Committee. He will normally ask to have his name included in the list of the executive council for the area of his choice and that council will inform the Committee. The Committee may give consent either unconditionally or subject to a condition as to the part of an executive council's area in which he may practise. They will not be able to withhold consent on any ground except that there are already enough doctors practising in the public service in the area in question. If, when a practice becomes vacant in a particular area, there is more than one applicant for taking it over, the Committee will decide to which doctor the necessary consent is to be given. Before reaching their decision the Committee is required to consult the executive council, which in turn is to consult the doctors' own local representative committee. A doctor whose application to practise in a particular area is refused, or granted only subject to conditions, is given the right to appeal to the Secretary of State.

The above control of succession to, or opening of, practices will apply to all practices which are wholly or partly within the service. It will, therefore, make the sale of the goodwill of such practices inappropriate, and the Bill provides for the prohibition of the sale of such practices in future and for compensation to existing practitioners in respect of the consequent loss of selling values. Regulations will govern the detailed method of apportioning the global sum among the doctors entitled to compensation and the manner and times at which it is to be paid. It is intended that the settling of the apportionment of compensation among the individual doctors shall be left in the main to the profession itself and the Secretary of State will accept any reasonable proposals within the sum available for Scotland. Normally compensation is to be payable on the retirement or death of a doctor, though payment at an earlier date will be arranged where hardship (e.g., through outstanding debts) would otherwise arise. In the meantime interest on the compensation due is to be paid each year to the doctor at the rate of 2¼% per annum.

Tribunal for Disqualification

A special Tribunal is to be set up to investigate cases where it is claimed—either by the executive councils or otherwise—that the continued inclusion of any doctor, chemist, dentist, or optician in the lists drawn up by the executive councils would be prejudicial to the efficiency of the service. The Tribunal will have a legal chairman, and will in each case include a member of the same profession as the person whose case is being investigated and one other. Where the Tribunal is satisfied that the representations are justified, the executive council will be directed to remove from the list the name of the doctor, dentist, chemist, or optician, who is given the right to appeal to the Secretary of State. Where the Tribunal so decides a similar direction can be applied to all lists in all areas, with the same right of appeal.

Where the Secretary of State is satisfied, after inquiry, that the services provided by doctors, dentists, or pharmacists in any particular area are not adequate he is empowered to take such steps as he considers necessary to secure an adequate service.

The Secretary of State is empowered to arrange with universities and other appropriate institutions for the provision of "refresher" courses for doctors, dentists, pharmacists, and opticians in the service, to contribute towards the cost of these courses, and to pay expenses of persons attending them.

Local Government Services

The "local health authorities" will be the councils of counties and of large burghs, with provision for combination wherever, exceptionally, this may be found desirable. Co-operation between the local health authority and the education authority providing the school health service, where these authorities are different, i.e., in large burghs, is already secured by section 14(5) of the Local Government (Scotland) Act, 1929, as rewritten by the Education (Scotland) Act, 1945. For most of these services the Bill requires the local health authorities to indicate to the Secretary of State the way in which they intend to carry out their responsibilities, which requires the Secretary of State's approval. Their proposals, so indicated, are to be made known also to the regional boards for the hospital service, to the executive councils for the general practitioner services, and to any voluntary organization which to the local authority's knowledge is working in the same field in their area.

Maternity and child welfare and domiciliary midwifery.—The Bill makes it the duty of every local health authority to make arrangements for the care of expectant and nursing mothers and of children under five years of age who are not attending school and who are therefore not covered by the school health service. The local health authorities are also to be the supervising authorities for the purposes of the Midwives (Scotland) Acts, and are to be responsible as under the Maternity Services (Scotland) Act, 1937, for providing a complete midwifery service for mothers who are confined at home. The midwives are to be employed either by the local health authority itself or by voluntary organizations with whom the authority comes to an appropriate arrangement. In addition to the clinic facilities, medical supervision before, during, and after the confinement will be available through the general practitioner service, but where advantage is not taken of this the midwife will have the usual right—and duty—to call in a suitably qualified doctor in case of need.

Health visiting and home nursing.—It is made the duty of the local health authority to provide for a full health visitor service for all in their area who are sick, or expectant mothers, or those with the care of young children. This widens the present conception of health visiting (as concerned with mothers and children) into a more general service of advice to households where there is sickness or where help of a preventive character may be needed.

Local mental health services.—Local health authorities are to be given responsibility for the ordinary local community care in the mental health service—that is to say, the ascertainment of mental defectives (so far as this is not the function of the education authority) and their supervision when they are living in the community. This part of the service covers also the initial proceedings for placing under care those who require treatment under the Lunacy Acts.

Vaccination and immunization.—Compulsory vaccination is abolished by the Bill, but the date for this change will be fixed later by Order in Council. In future it is to be the duty of the local health authority to provide free vaccination and diphtheria immunization for anyone who desires them. The authority will give doctors who are taking part in the general practitioner service the opportunity of undertaking this work. The vaccines, sera, or other preparations required may be supplied without charge by the Secretary of State to local health authorities and doctors, and the service may, if circumstances demand, be extended to cover vaccination and immunization against other diseases besides smallpox and diphtheria.

Care and after-care of the sick.—Local health authorities are given a new power, and duty where the Secretary of State so requires, to make approved arrangements for the purpose of the prevention of illness and the care and after-care of the sick. This can include such things as the provision of special foods, blankets, extra comforts, etc.

Domestic help.—Under the existing law local authorities are empowered to provide home helps as part of their maternity and child welfare functions and, during the war, this power has been extended by temporary enactments to enable them to provide domestic help in a wider range of circumstances. The Bill makes this power permanent and extends it to cover the provision of domestic help subject to the approval of the Secretary of State, to any household in which it is needed on grounds of ill-health, maternity, age, or the welfare of children. The local health authority will be allowed to make appropriate charges for this service.

Health committees.—Local health authorities will in future be required to appoint statutory health committees and to refer to them all matters relating to the discharge of their functions as health authorities. The health committees may be authorized to exercise functions on behalf of their parent authorities and there is the usual discretion to appoint by co-option expert members who are not members of the authority itself.

Scottish Health Services Council

To advise him generally on the administration of the health service the Secretary of State is to have beside him a Scottish Health Services Council. The members are to be doctors, dentists, nurses, and other professional people concerned with the different parts of the service, together with people having experience of hospital management, of local government and of mental health services—all of them appointed by the Secretary of State in their individual capacities, but after consultation with the appropriate representative organizations. The new Scottish Council will be free to advise the Secretary of State of its own initiative on any expert aspect of the services, as well as on matters expressly referred to it by him. It will report annually to the Secretary of State, who will lay the report before Parliament—with his own comments, if he wishes—unless he is satisfied that it would be contrary to the public interest to publish the report or any part of it.

The Secretary of State is empowered also to constitute various Standing Advisory Committees on different technical aspects of the new service. These Committees are not specified in the Bill. They will in fact deal with medical aspects of the service, mental health, dentistry, nursing, pharmacy, and any other matters justifying special advisory machinery. They will deal with questions referred to them either by the Secretary of State or by the Scottish Council and will have direct access to the Secretary of State as well as to the Council.

THE NEW ACT

DR. DAIN'S SPEECH AT EXETER

The Plebiscite: Practitioners' Responsibility

On the day after the Royal Assent was given to the National Health Service Bill Dr. H. GUY DAIN, Chairman of Council, addressed a large meeting of the Exeter Division. Between 150 and 200 were present. Dr. J. D. R. MURRAY, chairman of the Division, presided.

Dr. DAIN, who was received with enthusiasm, spoke as follows: The National Health Service Bill yesterday received the Royal Assent and became an Act and is now the law of the land. We members of the profession are in a position of great responsibility—all of us. On our actions now will depend the form of medical practice in this country for perhaps a long time to come. Under this Act it is proposed to give to every citizen free medical attention in his own home or wherever it may be required, including hospital service, the whole to be provided by the State partly out of taxes and partly out of insurance premiums.

As a medical service its first and most important group of officers must be its doctors, and we who may become its doctors are in a peculiar position. The Government which has produced this Act has refused to talk to us about it. Nothing more stupid can be imagined than to set up a scheme without consulting the people who are to carry it out. It is true that before this Government came in we had prolonged discussions with Mr. Willink, Minister of Health in the Coalition Government, on the form that a national medical service should take, and we got a long way towards agreement with him. Indeed, if the General Election had taken place a few months later we might already have had an agreed Bill in the House of Commons. At the election a Government was returned whose policy was the establishment of a whole-time salaried medical service for the entire community. The new Minister of Health, contrary to Labour Party policy, was charged with housing as well as health, and after taking office he refused to say anything about the medical service problem until he had dealt with housing. We were shut out of conversations with him until the end of last year, when we heard that a Bill was in preparation; then we put pressure on him to see us, and we had two or three conversations, in which he told us that the Bill would be his own production and that he was not prepared to consult with the medical profession as to its form or principles.

Nationalization of Medical Practice

We are now faced with an Act containing certain items of policy of which we have definitely disapproved. The Act is part of the nationalization programme which is being steadily pursued by the Government. What the Minister appears to have done is to have taken the Bill which we had partly fashioned and to have inserted into it the Socialist principles of State ownership of hospitals, direction of doctors, basic salary for doctors, and abolition of buying and selling of practices. None of these additions is likely to be of any value for the public: they will not help to produce a better service in any way; but, of course, they do affect us very materially. From being a profession of independent practitioners we are faced with a scheme which will almost immediately turn us into whole-time or part-time salaried servants of the State.

The Minister has said he is not prepared to give way on any of the things we stand for, and it is for us to look carefully at the Act and at our own agreed principles, and to say whether

we should go forward and discuss with the Minister the details of administration.

What are the effects on the practice of medicine of some of the proposals of the Bill? We have not regarded the ownership of hospitals as being so much our problem as that of the hospitals themselves, and as neither the voluntary nor the local authority hospitals have put forward any very definite or strong opposition to the Bill it has been rather overlooked that from the medical point of view this may be one of the most important factors. When the Minister owns all the hospitals he will not only administer them through a regional body but he will have power to say what are the terms and conditions of service and what must be the nature of the qualifications of the people who work in them. He has power under the Act—and he has said that he will insist upon it—to ensure that no doctor shall work in the hospitals unless he is a member of the service.

Consultants and specialists can hardly practise without hospital beds, and, as I see it, the Act is the end of independent private consulting practice, unless the consultants and their friends are prepared to set up nursing homes all over the country. A modification was made by the House of Lords to the effect that those entitled to treat private patients in private wards must be "either honorary or paid members of the staff." In a State service in which everybody is paid I cannot imagine what meaning is to be attached to the word "honorary," and I think the Minister, perhaps with some amusement, allowed the phrase to remain because it pleased the Lords and meant nothing. It looks to me as if one of the earliest effects of the Act will be that the greater proportion of consultants and specialists will become, to all intents and purposes, State servants.

If this is not Control, what is?

On the general practitioner side there are three special points to be borne in mind. As a first step towards making practitioners Civil Servants they are no longer to be allowed to buy or sell practices. The Minister has made a great deal of this buying and selling as an immoral act, describing it as the transfer of large blocks of patients, which is a complete travesty of the position whereby goodwill only is transferred. And although it is "immoral" for a general practitioner to buy and sell his practice it is not "immoral" for the consultant or for the dentist similarly to buy and sell. The general practitioner has looked to the capital value of his goodwill to provide him with an income on retirement, and, recognizing this, the Minister has said that compensation shall be paid; and 66 millions is set aside as the appropriate amount. It is not expected that more than five millions of this will be required during the first few years, for the capital will only be drawn by the practitioner on his retirement or by his executors at his death. Some provision will probably be made to assist doctors who are experiencing hardship through having borrowed money to buy their practices, but there is no guarantee that every doctor who is in debt will be able to draw the capital value of his practice straight away. There is only a vague statement that the problem will be dealt with.

Interest at 2¾% annually is to be paid on the capital value. We tried to impress on the Minister early in the year that it would be a businesslike proposition to pay out the 66 millions straight away, because the Government could borrow money at a cheaper rate than 2¾%, but we could not move the Minister. We have to bear in mind in considering this matter that a capital value which was assessed at 66 millions last year may be vastly different in twenty years' time, in view of the downward course of money values.

The Minister has said that it was necessary for the buying and selling of practices to be abolished in order to obtain a better distribution of doctors all over the country, the assumption being that there is an improper distribution to-day. That is not true. Doctors, on the whole, are not badly distributed. The Central Medical War Committee register has shown that in the areas where there appears to be an undue number a liberal discount has to be made for retired doctors and doctors who are themselves invalid and less active. The distribution of active doctors cannot be learned by taking the total number of doctors in a locality and dividing it into the population. It would be perfectly easy for us through our own organization to distribute the doctors quite fairly about the country without the Minister having the power to direct them.

The Act says that every doctor in practice on the appointed day—presumably April 1, 1948—can stay where he is, but that anyone coming into practice after that date will have to obtain the requisite permissions before he is allowed to settle in any area. Even though doctors in established practice are not liable to be moved, yet if they wish, for domestic, economic, or other reasons, to change their areas after the appointed day, they will have to obtain the permission of the executive councils in the area which they propose to leave and the area in which they propose to settle. If that is not putting us under control or direction I do not know what is.

Dictatorship

Next, the method of payment. We have attributed the importance of our professional position to the freedom we have to be employed by the patient and, in private practice, paid by him, or in insurance practice paid for him; but, whether paid by or for the patient, we have what is called free choice. So long as we are paid in proportion to the people we serve we retain that freedom. Those of us who have been in national health insurance practice have been quite unconscious of any restriction on our freedom. We declare that in a service for the whole community that same position should be maintained. Directly we begin to be paid even a basic salary we recede from that position, because, instead of our whole interest lying with the patient, a second interest is introduced in the form of the body which employs us or pays us a salary. An amendment passed by the House of Lords that general practitioners should be paid only by capitation fee was rejected by the House of Commons and has been taken out of the Act, the Minister insisting that it is of first importance to him that doctors should be paid, at any rate partly, by salary. You will be aware of the terrible penalties which have been inserted in the Act to ensure that goodwill is not sold twice over—to the State and to somebody else afterwards—and of the difficult position which the abolition of buying and selling of practices will create. It means that all partnerships which depend upon shared receipts and all assistants' agreements will be at an end. It will be necessary for the retiring practitioner to be extraordinarily careful in selling his house, which, though it may have been built or adapted as a doctor's house, must not command on that account any excess value which goes into the practitioner's pocket.

The Act, of course, in parts is good. It does contain one of the things for which we have asked for a long time—a proper organization of hospitals, whereby they do not act as individual units but are to be brought together in regions, based if possible on university centres, so that a more even standard of service is obtainable in remote hospitals. We have obtained representation on all the various committees which control the medical services. We argued with Mr. Willink on that point, and largely the new Act does not interfere with that, except that in every committee or council the Minister has complete control, with power to appoint its members and alter its constitution. The utmost concession we obtained is that the Minister would consult with us before making the appointments. He is not compelled to accept our advice. We had hoped that the Minister would appoint on our nomination, a method of setting up committees which has been accepted under many other Acts of Parliament, but here the Minister takes complete power.

By these powers he becomes the complete medical service dictator. He may use his powers beneficially, but we have seen a number of Ministers of Health during the last twenty years, and we know that the wisdom or beneficence of one Minister is not necessarily inherited by his successor. During the passage of the Bill through the House of Commons he opposed every attempt to limit his powers of appointment by saying that it was essential for the flexibility of the service that he should be able to make modifications where he thought necessary in the composition of these bodies without having to go back to Parliament. That was an excuse but no sound reason for departing from the position that we should have the right to nominate for the Minister to make his appointment.

A Vital Decision

What is now our position? A Special Representative Meeting early this year declared by 214 votes to 2 against control over doctors concerning choice of area of practice, by

210 to 29 against State ownership of hospitals, by 229 to 13 in favour of retaining the right to buy and sell practices, and by 209 to 8 in favour of the capitation fee method of payment. That is the policy which through your representatives you have laid down and which your Council is endeavouring to carry out. From to-day we are faced no longer by a Bill which may be altered but by an Act of Parliament. The Representative Body decided that as soon as the Bill became an Act a plebiscite should be taken of the whole profession to find out their opinion on the importance of the principles. If we think that the Act is so dangerous that we had better not proceed to discuss regulations, that the principles set out in the Act do not conform to our ideas of what is necessary to the freedom of medicine in the future, we shall indicate it in the plebiscite. On the other hand, if we think that the risks I have set out are exaggerated, that the Act will really make very little difference to us, and that the non-acceptance of our principles is not fundamental, then we shall tell our representatives to go and talk with the Minister on the details. Even supposing you answer "Yes" in the plebiscite you will be given a further opportunity of saying whether or not you wish to enter the service.

At the moment the Council is bound by the decisions of the Representative Meeting. What we are anxious now to secure is an answer in the plebiscite from every member of the profession. No greater calamity could happen to the negotiators than to find that only half the profession had taken the trouble to answer the question:

Do you desire the Negotiating Committee to enter into discussions with the Minister on the Regulations authorized by the National Health Service Act? Please answer YES or NO.

Excursion into Economics

Before saying anything more about the plebiscite I have a few words to say on the economic aspects. What are the prospects? The Spens Committee has reported that in 1938 doctors' incomes were on the whole too small and that they should have been increased by a certain amount. Starting from the lower incomes up to £1,200 a year net, the increase should have been roughly £200 a year. The capitation fee for insured persons paid at that time was 9s., and it was shown by doctors' returns that all other patients put together—private patients, club patients, etc.—were paying their doctors at the rate of 14s. a year; and, of course, we all know that the private patient was not requiring anything like the same amount of services as the insured patient. We asked accordingly that the insurance capitation fee should be adjusted in accordance with the Spens Committee findings, but the Minister was not prepared to discuss the capitation fee unless it was linked with the terms in the new service, though we impressed upon him that we represented insurance practitioners only and had no authority to deal with the new service at all. Later we were told that we had perhaps got a wrong impression of what the Minister meant, and were invited again to go to the Ministry; but in further conversations it seemed impossible to get the Ministry to dissociate the two things. The Minister announced that the capitation fee would be 12s. 6d. as from January 1, 1946. You know what has taken place since then, and what followed when the Minister learned that well over 90% of insurance practitioners were likely to put in their resignations. We are going to talk over these matters next week at the Ministry's invitation, and we shall get down to discovering what the Spens Report means in terms of capitation fee for national health insurance practice alone.

But these proceedings are very sinister. If at a time when we are only half-embroiled with the Minister and only half the population are at stake we have to resort to what may be called brute force in order to make the slightest impression on the Minister and his department, what hope is there when all are in it? The action of the department has been most illuminating—and most depressing.

Altogether it seems to me quite unlikely that, however we are paid in the new service, we shall obtain as much as from our present practices, which are partly insurance and partly private, and I see no reason why we should go into a service and be less well paid for it than we are to-day, when our services are sought by people as private individuals.

We have to take the 9s. pre-war capitation fee, plus 6d. added on the introduction of persons with incomes up to £420 a year, and to this we have to add, in the first place, the amount by which, according to the Spens Committee, doctors' incomes were inadequate in 1938. We claim that the inadequacy must be ascribed to the insurance side of the practice, because here a fixed fee operated which could not be adjusted according to economic circumstances. The average of this addition over the whole range of incomes is equivalent to £170 per 1,000 insured persons, or about 3s. 4d. per insured person, bringing the capitation fee to 12s. 10d. To this has to be added a betterment figure for altered values since 1938. When we talked with the Government over the compensation proposals—I agree now that it was a mistake to have talked at all—a figure of 22% was agreed to as reasonable, but I have had placed in my hands this week a report by an economic expert—the first in the country, for we always employ the best experts we can, believing in expert advice ourselves—and he says that the betterment figures now on 1938 values should be 45%. It is obvious that if that percentage had been taken when assessing compensation values 66 millions would not have been nearly sufficient. Therefore to the figure of between 12s. 6d. and 13s. we have to add 45% for betterment, showing that the 15s. of which so much has been made in the press has no relevance. My point in entering into all this is only to show the risks we run if we go into a service in which we are paid by salary and are in the hands of the State so completely.

The Plebiscite

I come now to the plebiscite. All members of the profession will shortly receive, together with a summary of the Act and a statement of conflict between the conditions laid down in the Act and our own principles, a form requesting an answer "Yes" or "No" to the question whether it is desired that the Negotiating Committee should enter into discussions on the regulations.

(Dr. Dain read here the statement "To every member of the profession" which appears on the form.)

The last sentence in that statement reads as follows: "Implicit in such a negative vote by general practitioners and the staffs of voluntary hospitals is an undertaking, if so advised by the Association, not to enter the new service." This has been framed having in mind medical officers of health who are already employed in a local authority service. We want to make it clear that the medical officer of health who is opposed to this new service because it contravenes the principles which the profession has laid down may properly vote "No" without being expected to resign his office, a thing which it would not be feasible or proper for us to ask him to do.

The difficulties with which some practitioners may be faced are fully realized, and action is being taken by the Association to deal with them. At the meeting of the Council yesterday we appointed a committee to consider the use to be made of the money at our disposal to meet cases of hardship. We are well aware of the difficulties of men in their forties with children to educate, and the handicap which it might be to some of them if all contract work were stopped consequent upon the resistance of the profession to the new scheme. We have very substantial sums in hand. If we wanted to do so we could to-morrow morning spend up to a million pounds, and there need be no doubt whatever that if the need becomes obvious it will be met. We are ready for action, and we put it to the members of the profession to-day that they need not be embarrassed in their decision at this critical moment because of financial considerations. We recognize, of course, that if it came to a fight we must all suffer some loss, but as it is true that, for the country as a whole, two-thirds of our incomes comes from private practice and other sources, and only one-third from National Health Insurance, it is not a question of the whole of the income of any person stopping suddenly. It was the view of a number of members at the Council yesterday that whatever happens will have to happen fairly quickly, and it is not reasonable to suppose that we shall have to prepare for a long and exhausting struggle. The Minister is under an obligation to maintain a service to the insured community, and if he is unable to put something in its place because of our opposition to the new service it is almost certain that the insurance medical service must continue.

We are anxious that everybody should answer according to his views and his conscience the question framed in the plebiscite. I am asked why the Association does not give a lead, why I myself as Chairman of Council do not give a lead. It is for the Council and for me when I get an opportunity to give you an understanding of the position so that you may take the responsibility of decision. It is your responsibility, and what the profession says will go. We want a reply to the question uninfluenced by any such consideration as to whether you may be left in the lurch or whether if you stand out your neighbours may take your place. You need not be afraid of being left in a small minority. There are no spare doctors; there are not enough to go round even in a small town.

I am asked what is my own view. The situation is entirely in our own hands. We have just learned that a strong and concerted action will force the Minister to do something which he was entirely unwilling to do. The threat—it was no more than the whisper of a threat—that insurance practitioners would resign if he would not agree to implement the Spens Report brought him to heel at once. Here we have an opportunity of saying that we will not take any part in a service that does not concede our principles. Why should we not get our principles accepted as well as the conditions of service? The conditions will have to be argued afterwards anyhow. Why not insist on our principles being established, by an amending Act or whatever it may be, before we agree for a moment to talk on terms and conditions? We should be no worse off; indeed we should be infinitely stronger in talking about terms and conditions if we had first by our own efforts secured the acceptance of our principles.

Dr. Dain's address was frequently applauded, and there was prolonged acclamation at the close.

Various Questions

Asked whether it was expected that retired practitioners should answer the plebiscite, Dr. Dain said that he certainly expected them to do so. The answers would be analysed in age groups. If a retired practitioner had not the same interest in events, he had the knowledge of his profession and of the validity of the principles they sought to establish.

Another practitioner was anxious that nothing should be done which might be construed as against the law. Dr. Dain replied that the profession was perfectly free to decide not to enter the service. They would be doing nothing against the law in deciding not to take part in it. They had the right to stay out, though they had not yet succeeded in obtaining the right to come in.

A reference was made to the reported satisfaction of consultants with the Act. Dr. Dain said that consultants must surely regard it as unsatisfactory to have no beds under their control which were not State-owned beds. To another question he replied that the Act laid down that the Minister might determine the qualifications of the people working in the service. Though it was not specified that this applied to doctors specially any more than to nurses or hospital porters the fact remained that the Minister had power to decide a qualification which was different from that set up by the General Medical Council. In one instance it was stated specifically that a general practitioner must not do midwifery unless his qualification was approved by the Minister. "We want that out, of course, among other things, but that is the dangerous position that he by this Act has the power to decide what shall be the qualifications for different jobs."

At the request of Dr. Roper, Dr. Dain gave a brief account of the position of State medical services in the Dominions, and referred especially to the satisfactory position in South Africa, where the South African Medical Association set up a committee to advise the Government, and the Government had appointed the chairman of that committee to be chairman of the Government committee to carry out the service.

Dr. G. LOWE, in proposing a vote of thanks to Dr. Dain, said that he, like others, had made criticisms of B.M.A. leaders, but he unhesitatingly withdrew them. In his addresses in various parts of the country and to the Representative Body and in his work on the Council and elsewhere Dr. Dain had proved a splendid leader. In a quiet and unassuming way he had marshalled the facts, of which he had a complete mastery. The way in which he and other B.M.A. leaders had acted during this long period of controversy excited his boundless admiration. They had always been careful to consider the wider interests of the public. Bureaucratic control was no more in the interests of the patient than in those of the doctor. The profession had been forced into this fight against its will. Its leaders had been brushed aside as stupid children. They had not been allowed to co-operate in the building up of a service about which they ought to know something, at least as much as an erstwhile miner, a trade union leader, and a member of the present Cabinet. He called for 100% backing of the B.M.A. in this vital struggle.

Dr. DAIN, in reply, repeated the things they really wanted.

"We want to put into the Act the right of every doctor to come in, and the right of appeal to the courts from the Minister's decision to take us out of the service; we want removed from the Act the State ownership of hospitals, the embargo on the buying and selling of practices, all direction of general practitioners, and the salary element in general practitioners' remuneration; we want altered the procedure of election on to the councils and committees so that we may nominate our own representatives instead of the Minister choosing them all, and in that way we may curb dictatorship in the service."

These points again were heartily cheered, and the meeting ended.

Correspondence

The Plebiscite

SIR,—Permit me to express my profound admiration and agreement with the fine, robust letter from Dr. Alfred Cox (Nov. 9, p. 707). One can only hope and, I might well add, pray that his stirring and powerful appeal will secure the unanimous support of the profession which he has so splendidly served all his life.—I am, etc.,

London, W.8. FREDERICK MENZIES.

National Health Service

SIR,—I have followed the correspondence on the proposed National Health Service appearing in your columns and would like to submit the following observations. The Bill, soon to become law, contains many provisions that are good; and so the scheme no doubt appeals in various ways to some individual members of the many sections of our profession. Thus the young doctor will welcome the prospect of not having to buy a practice; others will look with favour upon a certain security of tenure, while the young man anxious to specialize will see in it a chance to acquire and practise a specialty without enduring years of penury. But surely these considerations are really beside the point. The kernel of the matter, as far as the profession is concerned, is centred in this business of control. Initially, the conditions of service may appear rosy, but who will make these conditions or alter them as time goes on? If we find regulations concerning salaries or hours of work not to our liking to whom shall we appeal for redress? The government and control of hospitals and of the doctors will be in the hands of the nominees of the Minister.

Let each one in our profession, specialist or general practitioner, examine individually this aspect of the Bill as far as he himself is concerned. Recent European history has shown that the Führer, once elected, quickly entrenched himself behind his Gauleiters and Gestapo. As this matter of control overshadows the other provisions of the Bill, I consider that it is on this issue that the B.M.A. should mainly base its propaganda so that no doctor could afterwards say that he was left in ignorance by our Association.

As I have said, the Bill has many good points, but, unlike some of your recent correspondents, I am only as enthusiastic as one free from any illusions can reasonably be expected to be.—I am, etc.,

Consett, Co. Durham. K. M. MACDONALD.

Milk Priorities

SIR,—The Milk Rationing Scheme is too valuable to be allowed to break down for administrative reasons. If general practitioners had been consulted earlier, the present position need never have arisen. The problem is not one for scientific experts, but for practitioners. In my view, the causes of "lax certification" are the extreme vagueness of some of the categories for priority; the absence of other categories; the recognized abuse of the "children's milk" in a substantial number of cases; and the fact that there is no effectual equality in the basic ration as between some groups of consumers and others. It is a fact that some of the "children's milk" is either being given away or else being sold at a profit. It is a fact that in larger families (above four persons) and in hotels, etc., the ration is adequate for the simplest needs, but it is hopelessly inadequate in families of one or two. Since these facts are generally known, it is almost universally felt that the present scheme is "unfair." So long as the arrangements are felt to be unfair, means will be found to evade them.

In my opinion, the following changes should be made: Category 2c should be abolished (dyspepsia); "colitis" should be replaced by "ulcerative colitis"; "gastric, etc., ulcer" should receive a priority for six weeks only (but see below). A ten days' priority (after the first three days of illness) should be given to industrial workers who are *ill* in bed. It should not be given to the "injured or to short-period surgical cases." In all cases in which the doctor in charge thinks that effectual treatment requires a supply of priority-milk, an independent supporting certificate (e.g., from the M.O.H. or his deputy; from hospital consultants or [as has been suggested] from specially appointed practitioners) should be required. I regard it as essential that a category should be added so that the aged can receive more milk than they do at present. Every aged person suffers from "dyspepsia." This point might be met by increasing the basic allowance for small families of one or two persons.

Steps should be taken to "take the profit" out of the illicit sale of the children's milk. It seems to me that the cost of the milk used in a family of children should be made a direct charge upon the "family allowance." This could be done by making a charge for the *second* half-pint of the "subsidized milk allowed to children." Lastly, all milk given to children at school should either be drunk in the presence of a responsible person, or else collected (sterilized, if necessary, by re-scalding) and either sent to an institution or returned to the supplier next morning.—I am, etc.,

Worcester. HOWARD E. COLLIER.

SIR,—In the announcement issued by the Ministry of Food on Oct. 29, quoted in the *Journal* of Nov. 2 (p. 661), the Minister omits one of the main causes for the increased demand for milk in the United Kingdom. It is that from Aug. 6 milk in publicly provided schools and in private schools has become free to the tune of one-third of a pint per scholar daily. In certain special schools the amount permitted free is two-thirds of a pint. Whereas the consumption of milk in schools varied considerably from place to place before this arrangement was made, I think it will now be found that the consumption approaches nearly 100% of the school population. This free milk is in addition to the extra milk obtainable on the juvenile ration cards. Thus, children may obtain substantial supplies of extra milk from two sources while many elderly and frail people have to be content with milkless days. No one grudges children as much milk as they like provided there is enough milk to go round. It is however arguable, with due respect to the Government experts, that most boys and girls under the age of eighteen can and do eat and digest any ordinary food, whereas the elderly, the frail, and the invalid cannot. Before the Minister blames the medical profession for lax certification, he should put his house in order by reviewing drastically the whole system of milk distribution in this country. —I am, etc.,

Exeter. G. B. PAGE.

SIR,—For some time I have been of the opinion that a considerable economy in our very restricted milk supply could be effected by reducing the quantity of milk allowed in the Category 2c to half a pint daily. Many cases of mild dyspepsia cannot possibly manage on two pints of milk weekly, but could make a fairly comfortable diet on three and a half pints weekly. This would save three and a half pints weekly, as these cases now must have seven pints or be refused priority. Doctors, also, should be permitted to state the time for which all priorities are needed. One month is much too short for cases of thyrotoxicosis, nephritis, etc., and monthly repetition of these certificates wastes time. While on the subject of certification I should like to know whether some means of reducing this intolerable burden cannot be devised.—I am, etc.,

St. Leonards. ANNE BEATTIE.

SIR,—The public scandal of milk "priorities," now a subject of contemptuous comment in the lay press, will continue until something is done to stem the spate of medical certificates. Abolition of the ridiculous categories of "dyspepsia" and "colitis" might help. A woman to whom I refused a certificate which she demanded merely on the grounds that she "hadn't enough milk for the cat" informed me, subsequently, that she was able to obtain milk from a neighbour whose "doctor is not so strict and gives her milk certificates for anything." This is not, I have very good reason to believe, a unique case.—I am, etc.,

Hove. SIDNEY B. DEPREE.

SIR,—The Minister of Food has announced that medical certificates for priority milk supply to invalids will be disregarded if dated before Nov. 3. He excuses this dictatorial step by saying that medical practitioners have been granting more of these priority certificates in the recent past than they did during the earlier phases of the rationing scheme. It should be pointed out that doctors can only issue such certificates on a prescribed form, and only when they can certify that a patient is suffering from a definite condition on the schedule of diseases drawn up by the Ministry of Food. The obvious inference is that the Minister of Food does not accept the honesty of the doctors who have to issue these certificates. He has virtually stated that he does not put any value on certificates issued up to Nov. 3. What he should realize is that it is not the standard of medical honesty and integrity that has deteriorated during the war years but the standard of the nation's health. We doctors have stood about enough from him and his kind, and it is about time that we rejected this new idea of his with all its nasty implications. I can say clearly and fairly myself that every patient of mine at present receiving extra milk will continue to do so. I shall reserve the right to judge whether people are ill enough to require extra milk or not, and will certainly not be coerced into any attempt to deny them what is a necessity of life in their case merely to satisfy the whim of a nebulous Food Official, "one dressed in brief authority."—I am, etc.,

Tarbert, Argyll. A. KENNETH YOUNG.

Priority Certificates for Rationed Foods

SIR,—For years past the profession has acted as agents for the Ministry of Food in certifying on form R.G.50 any disease for which a patient could obtain priority rations. This has entailed much labour—unpaid to the extent that, though in theory one might make a charge, in practice I have never heard of anyone doing so. The work is unpleasant in that refusal of a certificate resulted in a disgruntled patient and often a subsequent loss to the practice. It should be noted that any resentment felt is directed against the *doctor*—not the Ministry, who have thus succeeded in shelving the unpopularity rightly belonging to it on to the profession. With the issue of the Ministry's instructions that all cases are to be reviewed an enormous amount of extra work will fall on doctors, with a still larger amount of unpopularity. We cannot refuse to do the work, as to do so would harm such patients as are rightly entitled to priority; but what we can do, and what I urge should be the routine procedure, is to give certificates *not* on form R.G.50, and *not* in the Minister's code, but giving details of the illness from which the patient suffers. This he can take to the Food Office, where the priority form will be issued or refused, so saving the doctor the explanations and arguments for which he has little time and less taste, and the unpopularity for which he is in no way to blame.

One further point: I note that the Ministry state that there is no evidence of increased illness to account for a 44% increase

in priorities. Might one ask where the Ministry get their figures of illness? It seems to me that the returns of deaths, infectious disease, and claims for N.H.I. benefit to which the Ministry have access bear little relation to the volume of actual work done by doctors or the amount of minor ill-health present in the community.—I am, etc.,

London, S.W.1. ARNOLD HARBOUR.

Work of Government Lymph Establishment

SIR,—My attention has been drawn to the article appearing in the Oct. 26 number of the *Journal* by Dr. H. S. Fremlin in which he describes the work of the Government Lymph Establishment from July, 1898 to June, 1946. It was with considerable surprise that I was unable to find anywhere mentioned the name of Lieut.-Col. W. D. H. Stevenson, C.I.E., M.D., D.P.H., I.M.S. (retd.), who was Director of the Establishment from 1930 to 1945 and was thus in charge throughout the strenuous times of the last war regarding which Dr. Fremlin says: "In addition *we* supplied 750,000 doses to Scotland during the 1942 outbreak of smallpox there, as well as dealing with minor outbreaks in England. Altogether from September, 1939, to May, 1945, over 15,000,000 doses were issued. At one time during the war *our* reserve stood at over 5,000,000 doses." (The italics are mine.) I know that Col. Stevenson when Director was not only responsible for the supply of lymph but for many years until his death in 1945 carried out many arduous researches for the Government on bacteriological and other issues in connexion with modern developments of vaccine lymph manufacture. It seems scarcely credible that no mention should be made of his name in what purports to be a review of the work of the Establishment up to last year,—I am, etc.,

Cambridge. S. R. CHRISTOPHERS.

SIR,—In reading the article by Dr. H. S. Fremlin (Oct. 26, p. 613) I was surprised to see that no mention whatsoever was made of the great work done either by the late Lieut.-Col. W. D. H. Stevenson, who was the Director of the Government Lymph Establishment from 1930 till his death in 1945, or by his colleague and second-in-command, Dr. G. G. Butler. On those two more than anyone else fell the great burden of meeting the tremendous demands for lymph from 1939 onwards, which Dr. Fremlin has described; and yet Dr. Fremlin writes "*we* supplied," etc., and "*our* reserve," etc., which, to those who do not know the facts, would suggest that *he* with his colleagues—unmentioned except for Mr. Sutton—had been responsible for this work. Honour to whom honour is due, and since, as I understand, his own good work ended in 1930, Dr. Fremlin would probably like to make the situation more clear than he has done in the latter part of his article, which presumably was intended only to stress the value of refrigeration in storing lymph during the war.—I am, etc.,

Letchworth. H. H. KING.

The Xenopus Test for Pregnancy

SIR,—Prof. Hogben's letter on the *Xenopus* pregnancy test (Oct. 12, p. 554) calls for a reply not only because it contains several gross misrepresentations of the true facts but also because many of the claims made in support of his contention are irrelevant. He writes: "Zwarenstein and Shapiro enjoyed the hospitality of my laboratory during their visit to London in 1933. We then demonstrated to them both the results of our pregnancy tests. . . ." In actual fact, Shapiro visited London for the first time in 1936 and Zwarenstein can state unequivocally and with certainty that neither Hogben nor Bellerby nor any other member of Hogben's department gave him any information whatsoever either verbally or by demonstration about pregnancy tests on *Xenopus laevis* during the time he was enjoying the hospitality of Hogben's laboratory in London in 1932–3. It is quite clear that Hogben's recollection of events does not correspond with the facts. In any case, if Hogben had communicated any such information about the test due and adequate acknowledgment of any private communication would, as a matter of course, have been made in our preliminary announcement of the test in October, 1933. The unquestioned priority for our description of the test is established by our communication to the Royal Society of South Africa on Oct. 18, 1933, when we stated the number of tests we had performed. This communication was actually abstracted in *Nature* on March 3, 1934, p. 339, and therefore appeared in England before Bellerby's letter to *Nature* on March 31, 1934. English readers were, therefore, in a position to have read our account before Bellerby published his own letter to *Nature*, in which he did not state the number of tests he had made.

Hogben's assertion is further controverted by the fact that the procedure of performing the test as described by Shapiro and Zwarenstein (1933) differs in all major respects from that described by Bellerby (1934). Shapiro and Zwarenstein employed the alcohol method and Bellerby, in his subsequent communication, described an acetone method for the preparation of urine extracts. According to Bellerby, actual extrusion of ova must occur in at least five of ten test animals before a positive diagnosis is made. Shapiro and Zwarenstein, on the other hand, regarded ovulation in *any one* of several test animals as a positive reaction. All subsequent work, by investigators all over the world, amply confirmed the accuracy of the standard laid down by Shapiro and Zwarenstein. Acceptance of Bellerby's criterion for a positive reaction would have led to many and serious errors in diagnosis and would have made the test valueless as a test for pregnancy. It is significant that no one subsequently adopted Bellerby's standards for a positive reaction.

It is interesting, at this stage, to recall the reasons which led Prof. Crew to suggest the association of Hogben's name with the *Xenopus* pregnancy test. They have nothing in common with those attributed to Crew by Hogben. Crew wrote (*B.M.J.*, April 15, 1939, p. 767): "I owe much to the willingly given help of Professor Hogben, now of Aberdeen, in whose laboratory in Capetown it was first shown that this anuran might with advantage be used for this particular purpose. I accordingly propose to refer to the biological test for pregnancy in which *Xenopus laevis* is used as the Hogben test." The statement that *Xenopus* was first used for pregnancy diagnosis in Hogben's laboratory in Capetown is incorrect, even according to Hogben's own account of the history of the test, and since this major assumption is incorrect a sense of gratitude would appear to be an inadequate reason for Crew's proposal.

The lengthy discussion about a captivity effect in Hogben's letter does not affect the point at issue, which is whether or not pregnancy urine can produce ovulation in *Xenopus*. No claim to the authorship of this test can be sustained unless the authors have been the first to describe such a reaction, and Hogben in his letter concedes our priority. We disapprove of an eponymous nomenclature for tests of this kind and have always regarded our own contribution as an obvious application based on the fundamental discovery of Aschheim and Zondek. Consequently, from the outset, we have preferred to call the test the *Xenopus* or frog test.—We are, etc.,

H. A. SHAPIRO.

University of Capetown, South Africa. H. ZWARENSTEIN.

Nomenclature of the Rh Blood Types

SIR,—In a recent article published in this *Journal* (June 29, p. 982) I described my latest improved nomenclature for the Rh–Hr blood types. The nomenclature proposed was devised in order to emphasize the analogies to the scheme of the four Landsteiner blood groups, so that the eight Rh types were designated as rh, Rh′, Rh″, Rh′Rh″, rh_0, Rh_1, Rh_2, and Rh_1Rh_2, respectively. This has caused some confusion to clinicians, who sometimes mistake the designation rh_0 for rh. For this reason, and because Rh_0 is the most important antigen clinically, so that for practical purposes when testing patients, bloods of types Rh′, Rh″, and Rh′Rh″ should all be considered Rh-negative, it is proposed to make a slight but important change in the designations which may help to clarify the subject further for the uninitiated. Under this slightly changed nomenclature the three Rh blood factors are now designated as Rh_0, rh′, and rh″, respectively, the capital letter being reserved exclusively for the factor Rh_0 in order to emphasize its special position and clinical importance. The eight Rh blood types now become: rh, rh′, rh″, rh′rh″, Rh_0, Rh_1, Rh_2, and Rh_1Rh_2, respectively. The new designations also have the advantage that they remove the danger of confusing the prime sign and the figure "one" in the superscripts, because the use of capitals and small letters removes any danger of ambiguity.

With respect to the reactions of the three types of Rh antibodies, it is now easy to remember that standard anti-Rh, or anti-Rh_0, reacts with Rh_0, Rh_1, Rh_2, and Rh_1Rh_2, but not with rh, rh′, rh″, or rh′rh″. On the other hand, anti-Rh′ reacts with all bloods containing factors Rh_1 and/or rh′—that is, types rh′, rh′rh″, Rh_1, and Rh_1Rh_2, respectively—while anti-Rh″ reacts with bloods containing factors Rh_2 and rh″. For clinical purposes, patients of types rh, rh′, rh″, and rh′rh″ are classed as Rh-negative, but for use as donors only individuals of type rh should be selected.—I am, etc.,

ALEXANDER S. WIENER, M.D.

Serological Laboratory, Office of the Chief Medical Examiner of New York City.

SIR,—To one who has been obliged to acquire his knowledge of the blood group Rh from published papers, Prof. D. F. Cappell's clear exposition (Oct. 26 and Nov. 2) is most helpful. Nevertheless I raise my hand in almost a last salute to the members of the Ayrshire Division of the B.M.A. if the paper was read to them as published. It would seem wise to support fully the use of the letters CDE. Fisher's terminology for the elementary antigens is neat and informative. But I beg that these sufficiently complicated factors should be capable of being as clearly and easily indicated in speech as in writing. Fisher suggests that the antisera should be denoted by Greek letters. Would it not be wiser to use Greek characters for cde? Would this really be too "troublesome for many workers"?

In accordance with Prof. Cappell's suggestion the antisera should be indicated in the simplest way by the use of "anti" before the English or Greek letters denoting the antigens with which they react. This should also be the invariable custom in describing the antisera of the ABO and MN groups. Further, it would seem advisable to indicate the alleles, whose discovery at the CDE loci is confirmed, by means of numerals instead of letters—e.g., C_2 instead of C_w.—I am, etc.,

G. E. W. WOLSTENHOLME, Lieut.-Col., R.A.M.C.

London.

SIR,—Prof. D. F. Cappell's excellent articles (Oct. 26 and Nov. 2) on this subject prompt me to raise a point about pronunciation. I have heard many otherwise estimable medical men talking about the "Ar-aitch" factor. Now the "rhesus" factor is presumably derived etymologically from the Greek word ῥῆσος, and the initial letter is ῥ (rho) with the ῾ or "spiritus asper." If one must contract the word "rhesus" I suggest it is easier to say "rho" than to say "Ar-aitch," and considerably more reasonable.—I am, etc.,

H. S. RUSSELL.

Shipley.

Recent Advances in Anaesthesia

SIR,—Mr. J. Johnston Abraham complains that in my recent article "no reference whatever is made to intravenous anaesthesia." If he would be kind enough to read through my poor effort, he will find a paragraph on this very subject in which the following occurs: "There is no doubt that the introduction of the rapidly acting barbiturates constituted a major advance in anaesthesia between the wars." I would be the first to admit that the subject of intravenous anaesthesia was not dealt with adequately, but to cover the whole of "Recent Advances" in 3,000 words was a task far beyond my powers.—I am, etc.,

C. LANGTON HEWER.

St. Albans, Herts.

Discovery of Chloroform as an Anaesthetic

SIR,—As a small addition to Dr. J. Y. Simpson's account of the "Discovery of a New Anaesthetic Agent More Efficient than Sulphuric Aether" quoted in the *Journal* of Oct. 12 (p. 541), Dr. Matthews Duncan told me, when I was clerking for him at St. Bartholomew's Hospital in 1886, that the chloroform used was found by him in the chemical laboratory of Prof. Gregory in Edinburgh and that he took it to the meeting on the celebrated occasion when the discovery of chloroform as an anaesthetic was made. He stated that he and several of the dressers in the clinic had made themselves quite ill by inhaling various volatile drugs, but that as he was the person who took the chloroform to the meeting he was entitled to some of the credit of the discovery.—I am, etc.,

PRIDEAUX G. SELBY.

Faversham.

The "Silver Ring"

SIR,—There is a suggestion of panic implied in the communication of the honorary secretary of the Family Planning Association (Oct. 19, p. 599), criticizing the "sudden revival" of the "silver" or "Grafenberg" ring as a means of contraception. Less bias and closer scientific scrutiny is advised before wholesale condemnation of the method can be justified.

The question of the choice of a contraceptive method should be decided on: (*a*) the personalities involved, (*b*) their previous experience, if any, of contraceptive measures, (*c*) the degree of security desired, and (*d*) the indications for or against any particular method of contraception. Only a very small proportion of the population seek contraceptive advice and it can therefore be accepted that the majority of married couples are content to carry out their own ideas on the subject. When men or women seek scientific information, however, they should be advised on the foregoing basis.

It is clear that in the case of erotic, unstable, and unintelligent types any method necessitating preparation of one kind or another would not be without danger. It might also be bad advice to suggest the use of an occlusive cap to an aesthetic individual who may find the manipulation "more trouble than its worth." Some women are so constructed that a cap is not well retained. Others find a sheath irritating, locally and psychologically, and numerous men report interference with pleasure and/or potency with the rubber condom.

The "safe period" and "withdrawal" methods are used by many couples who for financial reasons or inability to find suitable accommodation are temporarily reluctant to start a family but who, nevertheless, are glad enough to welcome the baby in the event of an "accident." It is a very different story when the wife has advanced cardiac or renal insufficiency, pulmonary tuberculosis, gross neurosis, or incipient psychosis. It is then necessary to recommend a more certain contraceptive method rather than expect such patients to submit to therapeutic abortion.

Failure with an occlusive cap would naturally tend to bring that particular method into disrepute as would discomfort and discharge in the case of the "Grafenberg" ring. It is obvious that a foreign body in the uterus would be contraindicated in a case of gonococcal cervicitis or other infection. No hard-and-fast rules can be laid down except that contraceptive advice should only be given by those who have practical experience of the various methods and technique and who, in addition, have some knowledge of sexual psychology.

It is quite inaccurate to suggest that no progress has recently been made in contraceptive technique. Experience with the "Grafenberg" ring has proved it a most satisfactory method of contraception provided that it is properly applied with all necessary safeguards in suitable patients. I have found less than 5% in something approaching a thousand cases exhibit a mild menorrhagia. I have not encountered any cases of failure or infection which could be attributed to the ring per se. Further, pathological examinations in several hundred diagnostic curettages, which I have had carried out as a routine in all cases when the ring is changed after twelve months, have failed to indicate any gross uterine changes. I propose publishing these results at a later date. I, myself, always regard the insertion of a Grafenberg ring as something in the nature of a minor operation, which should only be performed in a nursing home and under an anaesthetic.

I entirely agree that a simpler and more generally applicable method of contraception is desirable and that further research in this direction should be stimulated, especially as the most consistent factor in precipitating neurosis in women over 35 years of age is fear of pregnancy. I cannot help but feel that the criticism which has been directed against the "Grafenberg" ring has been determined by a survey of cases in which the technique of insertion was faulty or, alternatively, in which a "Grafenberg" ring would appear to have been contraindicated.—I am, etc.,

EUSTACE CHESSER.

London, W.1.

Treatment of Ingrowing Toe-nail

SIR,—I am very glad to see from Dr. J. C. Leedham-Green's letter (Oct. 19, p. 589) that he has found my method of treating ingrowing toe-nail so successful. There is, however, one point which he has not mentioned which I think is perhaps the most important of all and that is the treatment of the spur on the nail which is found on the affected side. This is so obviously the cause of the irritation and pain that the temptation is always to remove it. If this is done recurrence is almost certain. The correct procedure is to lift that edge of the nail with the spur upwards and over the surrounding tissue, packing

underneath, thus preserving the full width of the nail, and every day to raise it a little more. If this is done and the nail subsequently cut square across there will be no recurrence. The spur is undoubtedly caused by cutting the nail in a rounded fashion and leaving a small portion at the end.—I am, etc.,

Taynuilt, Argyll. P. F. CHAPMAN.

Novel Method of Digital Traction

SIR,—Our attention has been drawn to Dr. Kenneth MacLeod's recent description of a novel method of digital traction by means of a thread passed through a hole in the nail and attached to a "banjo" splint (Oct. 26, p. 614). We have used this method at Ronkswood Hospital, Worcester, for more than two years, and have incorporated additional refinements such as the use of elastic in the extension and the fitting of a second "banjo" loop at right angles to the first to give support by means of little rubber slings under the proximal inter-phalangeal joints for those cases in which this is desirable. The appliance has proved most useful for minor fractures, peripheral nerve injuries, etc. We are sorry to disappoint Dr. MacLeod, but his "new" method is an old-established practice at our hospital.—We are, etc.,

E. W. BINTCLIFFE.
Worcester, HIREN DE.

SIR,—This method can hardly be called novel. On page 317 of Trueta's *War Surgery*, published in 1943, a better procedure is illustrated, thanks to the simple device of threading the end of the nail and the retention of all the finger joints in flexion rather than in extension, the latter being the undesirable position maintained by the "banjo" splint shown in the photograph accompanying Dr. MacLeod's memorandum.—I am, etc.,

Swindon. F. LOUIS.

Obituary

SIR EDWARD THORNTON, K.B.E., M.R.C.S.

We regret to learn that Sir Edward Thornton, formerly Secretary for Public Health and Chief Health Officer for the Union of South Africa and D.G.M.S. of the Union Defence Forces with the rank of brigadier, died on Oct. 26 at Pretoria. He had been chairman of the Pretoria Division of the B.M.A. and president of the Northern Transvaal Branch, and presided over the South African Medical Congress in 1934.

Edward Newbury Thornton, sixth son of Thomas Thornton, of Sporle, Swaffham, Norfolk, was born on June 10, 1878, and from Cheltenham College came to study medicine at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1902 and later taking the Cambridge D.P.H. After service in the South African war and on plague duty in India he entered the Public Health Department of Cape Colony as additional medical officer in 1903, and in 1910–14 was medical adviser to the Cape Province Administration and chief local government inspector of the Province. At the outbreak of the 1914–18 war he joined the South African Expeditionary Force and in 1915–20 commanded the large South African Military Hospital at Richmond Park, Surrey, where he inaugurated the scheme for the vocational training of disabled soldiers during their stay in hospital, and was chairman of the executive committee on vocational training in military hospitals in the London District. He was created K.B.E. (Military Division) in 1919. On returning to South Africa he was appointed D.M.S. of the Union Defence Forces and assistant health officer to the Union, and chairman of the Housing Board. His early work as a plague officer in the Punjab at the beginning of the century led the Government of Nigeria in 1926 and the Administration of the Uganda Protectorate in 1930 to seek his advice on the control of that disease.

Sir Edward Thornton was a versatile man of great energy. He published many reports and scientific articles, and at one time held the chair of public health in the Witwatersrand University; he had a seat for a long period on the South African Medical Council and was an authority on the organization of State-aided hospitals and charitable institutions.

C. E. K. HERAPATH, *M.C.*, M.D.

We regret to announce that Dr. Charles Edward Kynaston Herapath, a former chairman of the Bristol Division of the B.M.A., died on Nov. 4 aged 64. His father was the late C. K. C. Herapath, and he studied at the Bristol Medical School, taking the English Conjoint qualifications in 1907, the M.B., B.S.Lond. degrees in 1908, and the M.D. two years later. His earliest appointments were those of house-physician and house-surgeon at the Bristol Royal Infirmary, and he was for some years physician to the Bristol Dispensary. During the war of 1914–18 he held a temporary commission as major in the R.A.M.C. and won the Military Cross; four years after his return to civilian life he was awarded the Colston research fellowship.

For many years Dr. Herapath was honorary physician and Dean of Faculty at the Bristol Royal Hospital, clinical lecturer in medicine in the University of Bristol, and cardiac specialist to the Somerset County Council; he was also honorary physician to the Winford Orthopaedic and Heart Hospital, and consultant to the Clevedon Cottage Hospital, the Northwood Mental Hospital, and Southmead Hospital. He was a member of the Association of Physicians of Great Britain and Ireland and of the Cardiac Society, and published a number of papers on diseases of the heart, which appeared in these columns and in the *Lancet*. He joined the British Medical Association in 1909, was joint honorary secretary of the Bath and Bristol Branch for ten years, and chairman of the Bristol Division in 1936. At headquarters he served for four years on the Medical Students and Newly Qualified Practitioners Subcommittee.

We regret to announce the death of Prof. MARCEL BRULÉ of Paris. In later life a well-known physician, he was formerly Chef de Laboratoire of the Faculté de Médecine of Paris, where his work on liver diseases and especially on jaundice made his name familiar far beyond the borders of France. He was an old friend of Sir Humphry Rolleston and of many other physicians in Britain and America.

Grief came to the medical profession of Cheltenham and to his numerous patients when Dr. BASIL TAYLOR died on Oct. 24 at the age of 62 after three weeks' illness. A son of the late Rev. George Taylor, rector of Great Witcombe, he studied at Durham University and graduated M.B., B.S. in 1908. He then entered the Royal Navy, from which he retired in 1919 with the rank of surg. lieut.-cmdr. He saw service in the original *Dreadnought* and with Evans of the *Broke*. J. R. C. writes: Basil Taylor came to practice in Cheltenham 24 years ago and was appointed on the medical staff of Cheltenham College and also to the Cheltenham Hospital for Sick Children. Endowed with an extraordinary charm of personality, a lasting boyish temperament, always courteous, always cheerful, he made one think that he brought with him from his life in the Navy some of the freshness and vigour of the sea. I think that it was his work at Cheltenham College that was nearest his heart, and his temperament made him a welcome and successful doctor with that observant and critical patient the public school boy. He won their confidence, and they knew that no matter how hard-worked he might be they came first. The funeral service was held at the College chapel and was attended by the Headmaster, the staff of the College, many of the medical profession, and a large congregation of his patients and friends. Devoted to his patients, loyal to his colleagues, happy in his home, it may be said that he was fortunate in his life and also fortunate in his death that he should be mourned by so many. He had been a member of the B.M.A. for 34 years. He is survived by his widow and two sons, both majors in the Royal Artillery. A third son, also a major in the R.A., died this year.

Dr. C. B. VAKIL, who died on Oct. 23, was an Indian who spent his professional life in England after qualifying M.R.C.S., L.R.C.P. in 1913 from St. Bartholomew's Hospital. He was born at the end of 1882 and began his medical studies in Bombay. He practised in various parts of London and joined the B.M.A. in 1930. A colleague writes: Dr. Vakil was a man of quiet manner with a deep passion for his ideals—the welfare of his fellow men, the freedom of his country, and the well-being of his patients. These qualities endeared him to all kinds of people; his passing was mourned by a large gathering, including lawyers, doctors, students, business men, journalists, and labourers. He leaves a widow but no children.

The Services

The *London Gazette* has announced the award of the George Cross to Lieut.-Cmdr. PATRICK ALBERT O'LEARY, D.S.O., R.N., a Belgian doctor known to his countrymen as Dr. Albert Edward-Marie Guerisse, who became a British naval officer. The citation reads as follows:

Lieut.-Cmdr. O'Leary was captured by the French police during operations off the south coast of France in April, 1941. He escaped while *en route* to a French prison, and thereupon set up an organization to help the escape of Allied prisoners of war and evaders. Through his skill and his sustained personal bravery, the organization succeeded, between April and August, 1941, in getting away some 150 officers and men, many belonging to the Royal Air Force. At increased risk to himself, Lieut.-Cmdr. O'Leary was soon forced to expand his organization, to help an ever-increasing number of evaders. To keep the members working at full pressure, and to inspire their confidence, he travelled frequently between the Dutch border and the south of France through numerous German controls, himself escorting numbers of escapers. If any question arose of hazard greater than usual, Lieut.-Cmdr. O'Leary carried out the work himself. In March, 1943, he was betrayed to the Gestapo by a member of his group. Arrested, he was put to many forms of torture in an attempt to make him reveal the names, whereabouts and duties of the other members. He was put in a refrigerator for four hours, he was beaten continually, but never did he disclose information which could be of profit to the enemy. After more ferocious experiments the Germans gave him up as hopeless, and sent him to a concentration camp where he was once again the victim of torture. He was a prisoner in Mauthausen, Natzweiler, Neubremm and finally Dachau. He nearly lost his life in the Neubremm quarries, where he was beaten insensible. Throughout his time in prison, Lieut.-Cmdr. O'Leary's courage never faltered. Numbers of prisoners have given evidence that his moral and physical influence and support saved their lives. On his liberation from Dachau, Lieut.-Cmdr. O'Leary refused to leave the camp, where he had been made "President" of all the prisoners (including some thousands of Russians), until he had ensured that all possible steps had been taken to ease the lot of his fellows. He was then given the opportunity to return to his family, but he insisted on proceeding to France, to trace the surviving members of his organization, and to help them in any way he could. From the time of inception until the end of the war, Lieut.-Cmdr. O'Leary's group was responsible for the rescue and successful return of over 600 British and American officers and men. It is now known that over 250 owe their safety directly to Lieut.-Cmdr. O'Leary, whose fortitude and determination matched every task and risk.

Fl.-Lieut. A. N. H. Peach, R.A.F.V.R., has been mentioned in dispatches in recognition of gallant and distinguished services in Malaya, Hong Kong, and the Netherlands East Indies during the operations against the Japanese ending in March, 1942.

The following appointments and mention in dispatches have been announced in recognition of gallant and distinguished services while engaged in special operations in South East Asia:

M.B.E. (Military Division).—Majors (Temp.) J. G. Dumoulin and A. Rapoport, and Capt. E. J. Harrison, R.A.M.C.

Mentioned in Dispatches.—Major (Temp.) C. E. Aston, R.A.M.C.

CASUALTIES IN THE SERVICES

Fl.-Lieut. RAYMOND GEORGE BLACKLEDGE, previously reported as missing, has now been presumed to have died about Jan. 20, 1945, while a prisoner of war in Japanese hands. He was born in August, 1912, studied medicine at Oxford University and St. Thomas's Hospital and qualified B.M., B.Ch., and M.R.C.S., L.R.C.P., in 1937. After holding house appointments at St. Thomas's, the Radcliffe Infirmary, Oxford, and the Miller General Hospital he was commissioned in the Medical Branch R.A.F.V.R. on Sept. 10, 1940.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a reception at the College on Oct. 30, to celebrate the centenary of the first administration of ether in this country, the Princess Royal, Hon.F.R.C.S., unveiled a memorial tablet marking the centenary and honouring the four British pioneers, Henry Hill Hickman, James Young Simpson, John Snow, and Joseph Thomas Clover. Dr. A. D. Marston, president of the Association of Anaesthetists of Great Britain and Ireland, in his address pointed out that of the three English pioneers one was a Fellow and the other two were Members of the Royal College of Surgeons of England, and said that no more suitable place for the keeping of their memory could be thought of than within the precincts of the ancient and famous College which was their alma mater. Dr. Marston gave a brief account of the life and work of each of the pioneers and of their contribution to anaesthesia. Hickman's life was short (1800–30). He lived before the actual introduction of anaesthesia, but made experiments on animals and reported them to the Medical Society of London, and was convinced that means would be found to relieve human suffering. Sir James Young Simpson, the celebrated Scottish physician, had attained the age of 35 years and considerable academic distinction at the time of the first administration of ether in this country. As professor of medicine at Edinburgh University and a leading exponent of obstetric practice Simpson had constantly sought means of alleviating the pangs of childbirth. John Snow, a Yorkshireman, was practising medicine in London when he read in the *Lancet* Bigelow's account of the Massachusetts demonstration, and he began to study the possibilities of anaesthesia at the age of 33. Clover, a native of Norfolk, became F.R.C.S. at the age of 28, and decided to devote his life to the study and practice of anaesthesia. He did much valuable work in restoring ether to its place as the principal routine anaesthetic agent, and spent years in perfecting his famour inhaler.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow the following officers were elected for the ensuing year: *President,* Dr. Geoffrey B. Fleming; *Visitor,* Mr. J. Scouler Buchanan; *Honorary Treasurer,* Mr. Walter W. Galbraith; *Honorary Librarian,* Dr. Archibald L. Goodall; *Representative on General Medical Council,* Mr. Andrew Allison.

VICTOR HORSLEY MEMORIAL LECTURE

The Victor Horsley Memorial Fund, which was raised in 1920 to commemorate the services of Sir Victor Horsley to Science and the Empire, is devoted to the giving of a lecture triennially in London entitled the "Victor Horsley Memorial Lecture." By invitation of the Trustees (the Presidents for the time being of the Royal Society, the Royal College of Surgeons of England and the British Medical Association, the senior physician of the National Hospital for the Paralysed and Epileptic, Queen Square, the senior surgeon of University College Hospital, and Mr. Stanley G. Robinson, son-in-law of Sir Victor Horsley) the seventh lecture will be delivered by Dr. F. M. R. Walshe, F.R.C.P., F.R.S., physician to the National Hospital, and physician-in-charge, Neurological Department, University College Hospital, in the Lecture Theatre, National Hospital, Queen Square, W.C., on Wednesday, Nov. 27, at 5 p.m. The title of the lecture is "The Contribution of Clinical Study to the Physiology of the Cerebral Motor Cortex," and the chair will be taken by Sir Alfred Webb-Johnson, Bt., P.R.C.S. Admission to the lecture is free on presentation of visiting card.

Medical Notes in Parliament

HEALTH SERVICE BILL

Royal Assent

Final discussions on the National Health Service Bill arose in the House of Lords on Nov. 6 on a Government motion that the House should consider the reasons advanced by the House of Commons for disagreeing to certain amendments previously made by the House of Lords.

A Lords amendment transferred to the Metropolitan boroughs and the City of London some of the health services which the Bill, as introduced, concentrated under the London County Council. In rejecting this the House of Commons formally expressed the opinion that it was expedient for all services to be provided under Part III of the Bill in any area to be the responsibility of a single authority and that in the County of London, as in other counties, the appropriate authority was the county council.

In defending the decision of the House of Commons the LORD CHANCELLOR said that to be effective the supervision of expectant mothers, and also prenatal and postnatal care, must be co-ordinated with the domiciliary midwives service through one authority responsible for all related facilities. Before the war 25% of the births in London were attended by these L.C.C. services and that figure had substantially increased.

Lord BALFOUR OF BURLEIGH said midwifery was transferred from the borough councils to the London County Council only a few years ago. Integration had remained complete and mothers were unaware that the midwife was the servant of the L.C.C. while the health visitors were servants of the borough councils.

On the motion of the Lord Chancellor the House agreed not to insist on its amendment.

The Major Method of Remuneration

To the amendment made by the House of Lords respecting the remuneration of general practitioners undertaking to provide general medical services under the Act the Commons had disagreed on the ground that it was inexpedient that the method of remunerating the doctors providing these services should be laid down in the Statute.

The LORD CHANCELLOR submitted that the peers' amendment was too restrictive. He said it would be ridiculous if an Act of Parliament were necessary to vary the method of remuneration agreed to by the profession. He moved that the House should not insist on the amendment. He could not say what the proportion of salary should be in the normal case. "That must depend on the consultation which we shall enter into with the profession itself, but the Government's intention, subject to what the profession may say, is clear. It has been said several times. It is that a salary should be an element only, a minor matter, and that the major method of remuneration should be by way of capitation fees. That has been stated by the Minister several times, and was restated when the Commons considered this matter again."

Lord LLEWELLIN, who had originally moved this amendment, rose to say he accepted the Lord Chancellor's motion.

Lord HORDER said the principle which underlay the amendment had not been modified by the Minister, but the position had, to some extent, been clarified. Mr. Bevan's assurance that the main part of the remuneration would be by capitation would, however, not bind future Ministers. If the regulations on this and other matters were to come up for discussion before they were put into operation, then medical men would feel more satisfied. He understood that by regulation it was still possible to change the percentages of the two forms of remuneration, or even to do away with one or other of those forms. If the capitation method of payment were done away with at some future time the fear that the Bill was the thin end of the wedge in respect of a national service would be intensified in the minds of doctors. Colleagues in general practice were left cold by Mr. Bevan's assurance that it was not the intention of the Government to make the present proposal the beginning of establishing a full-time salaried service. If the Minister wished to have the profession with him, as he had said, he could have gone further. It was still doubtful whether the doctors were going to come in willingly and enthusiastically to work the scheme. Lord Horder hoped they would. The pose of the Government of doing certain things for the sake of the doctors so that they could do their work without financial anxiety and could be freed from competition was odd when no clamour in respect of those matters had been heard from the rank and file of the profession. Doctors were not dissatisfied with a certain amount of insecurity when they started nor with a healthy spirit of competition as they went along.

Lord MORAN thanked the Lord Chancellor for his reasonableness during the discussions on the Bill. The Lord Chancellor had not argued that the basic salary was a measure of security for the young practitioner beginning practice. He had not suggested a basic salary to prevent early casualties in the legal profession where these were much heavier. Barristers did not want a basic salary. Neither did the doctors. Lord Moran said he had been dean of a medical school for twenty-five years where each year 60 or 70 men qualified and went into practice. He had never heard security discussed. There was a fundamental belief throughout the profession that there was something profoundly wrong with a man if he could not make a livelihood in medicine. This question of a basic salary was a figment of the political imagination, a debating point and no more. A second argument had been that payment by capitation fee led to abuses and undesirable practices. In the House of Commons the Minister had said that did not apply to more than a very small proportion of doctors. So, said Lord Moran, because there were a few black sheep, the whole remuneration of the rest of the medical profession was to be altered in a way which the profession almost unanimously felt might result in a deterioration of medical practice. When the Bill became law the vast majority of the profession would work under it. It was of enormous importance that they should have confidence in the Ministry of Health. That confidence would not be created if there were impugning by the political world of the honesty of the great body of the profession. Debates on this particular amendment had seemed unreal to the profession because, generally speaking, doctors did not believe that the reasons given for introducing a basic salary were the real ones. They thought it was an instalment, to be increased from time to time, towards a condition of affairs which would ultimately result in the basic salary becoming a whole-time salary. Ministers of Health came and went, but this principle remained a basic faith in the Party which had so often expressed it. If the basic salary ever became a whole-time salary, Parliament would embark on a condition of affairs whose effect on the proficiency of the profession could not be calculated.

The House then agreed with the Lord Chancellor's motion not to insist on its amendment.

Later in the same day a Royal Commission signified the Royal Assent to the National Health Service Bill.

Release of Medical Officers

On Nov. 6 Sir ERNEST GRAHAM-LITTLE asked whether Mr. Bellenger knew that doctors in the Forces over-seas suffered from uncertainty with regard to their release, their anxiety being occasioned by the issue at the end of 1945 of a Government statement reducing the ratio of doctors to two per thousand, which was contradicted by a later Army circular fixing the ratio at 2.75 per thousand. He asked the Minister to inform the officers concerned of the actual position.

Mr. BELLENGER replied that the ratio of two doctors per thousand troops was agreed under the conditions existing at the end of 1945 to enable the maximum number of doctors to be returned to civilian practice for the winter months. By that measure the Army alone was able to release 5,600 doctors by the end of February. Present estimates, based on an over-all cover of 2.75 doctors per thousand British troops, provided also for medical commitments other than those that could be considered a purely military responsibility and for military families overseas. The release programme for medical officers must depend upon the strengths and deployment of the Forces generally. Dates for release of the various age-and-service groups were announced as soon as possible. The release of doctors was thus inevitably linked with the release programme for the Army as a whole. Whatever the percentage of doctors per thousand, there must necessarily be some uncertainty for individuals until a definite programme had been announced. There was no more cause for uncertainty in the minds of doctors than in the minds of any other members of the Forces.

West African Medical Services

Mr. A. CREECH JONES told Mr. SORENSEN on Nov. 6 that the expansions of the medical services in the West African colonies envisaged for the next ten years were considerable. Nigeria was devoting nearly £9,000,000 under its £55,000,000 development plan to these services and by 1956 would have more than doubled its present annual expenditure of nearly £1,000,000. The number of hospital beds would be multiplied two and a half times and the medical staff trebled. In addition, over £8,000,000 was to be spent on improved water supplies, which should have a marked effect on the health of the people. In proportion to its resources, Sierra Leone proposed expenditure of a similar order. Although the plans for the Gold Coast and Gambia were not yet final, they provided for substantial expansion. Mr. Creech Jones added that having regard to the limitation of the available resources and the need of other equally essential services, it would not be wise to contemplate further expansions unless the future revenues of the territories concerned turned out to exceed expectations.

Medical News

Five candidates were nominated at Edinburgh University on Nov. 6 for the Scottish Universities Parliamentary by-election to fill the seat in the House of Commons relinquished by Sir John Boyd Orr. Two are medical men: the Right Hon. Walter Elliot (Conservative), and Mr. R. Scott Stevenson, F.R.C.S.Ed. (Liberal National). Polling at each university will take place between Nov. 22 and 27 on days appointed by the several Vice-Chancellors. The result will be declared on Nov. 29 in Edinburgh.

The London Medical Exhibition will be resumed, after a wartime break, at the New Hall, Royal Horticultural Society, Westminster, London, S.W.1, from 11 a.m. to 6.30 p.m., daily from Nov. 18 to Nov. 22 inclusive. Doctors who wish to attend, and have not been sent an admission card, can obtain one, free of charge, from the Secretary, London Medical Exhibition, 194–200, Bishopsgate, London, E.C.2. Tel. Bis. 2148.

A meeting of the Hunterian Society will be held at Apothecaries' Hall, Blackfriars Lane, Queen Victoria Street, E.C., on Monday, Nov. 18, at 8.30 p.m., when the motion "That the Advertisement of Proprietary Medicines is a Menace to the Public" will be discussed. For the motion: Mr. Hugh N. Linstead, M.P., Dr. G. H. Day; against the motion: Mr. Arthur Mortimer, Mr. J. S. Walmsley. The meeting is open to medical and non-medical guests and the Council hopes that Fellows will avail themselves of the opportunity to invite guests who are interested in the subject.

A lecture on "New Factors concerned in the Coagulation of Blood" will be given at University College Hospital Medical School (Lecture Theatre No. 1) by Dr. P. A. Owren (Akers Hospital, Oslo, Norway), on Friday, Nov. 22, at 4.30 p.m., when the chair will be taken by Prof. C. Rimington. Students and others interested in the subject are invited.

A meeting of the Middlesex County Medical Society will be held at Chase Farm Hospital, Enfield, on Thursday, Nov. 28, at 3 p.m., when clinical cases will be shown and a paper read by Mr. J. A. Dunlop on "Pre-vesicular Prostatectomy: Experiences with 25 cases."

The Albert Medal of the Royal Society of Arts, awarded jointly this year to Sir Alexander Fleming and Sir Howard Florey for their services in the discovery and development of penicillin, was handed to them privately on Nov. 4 by Viscount Bennett, president of the Society. Lord Moran, P.R.C.P., and Sir Alfred Webb-Johnson, P.R.C.S., were present.

Mr. Horace H. Rew, Secretary to the Examining Board in England, will retire on Nov. 30 and will be succeeded by Mr. F. M. Stent, the present assistant secretary.

Two American visitors of interest to the medical world who have recently been in England are Dr. Kendall Emerson, managing director, and Mr. F. D. Hopkins, executive secretary, of the National Tuberculosis Association of the U.S.A. The Duchess of Portland and the Council of the National Association for the Prevention of Tuberculosis entertained Dr. Emerson and Mr. Hopkins to luncheon on Nov. 1, when the keynote of the speeches was the importance of the closest co-operation between Great Britain and the United States in the fight against tuberculosis. At a Council meeting afterwards, attended by Dr. Emerson and Mr. Hopkins, various matters of interest to the two associations were discussed, including the situation which will confront voluntary bodies when the World Health Organization comes into being.

Two distinguished Brazilian medical men are now in this country as the guests of the British Council. Dr. Reynaldo Neves de Figueiredo, who is here to study anaesthetic techniques, is head of a team of eight doctors in the General Hospital, Sao Paulo, who specialize in anaesthesia. Dr. Moacyr Alvaro is one of Brazil's leading ophthalmic surgeons, and will see something of the work of eye hospitals in London.

Dr. John Charles Wootton, part proprietor and medical superintendent of Haydock Lodge, Haydock, Lancs., a nursing home for mental patients, successfully appealed on Nov. 5 against conviction and a £50 fine at Newton-le-Willows because forms claiming priority milk were incorrect. The Liverpool County Quarter Sessions Appeals Committee quashed the conviction with costs.

Surgeon Rear-Admiral Sir Gordon Gordon-Taylor has been honoured by the award of the Legion of Merit, Degree of Commander, by the President of the United States of America.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* there was a general increase in the prevalence of measles 499, scarlet fever 161, whooping-cough 124, paratyphoid 67, and diphtheria 36.

Notifications of scarlet fever showed the largest rises in Yorkshire West Riding 42 and Staffordshire 32. There was an increase in the incidence of diphtheria in Lancashire 15: almost an eighth of the total cases of diphtheria were notified in Liverpool C.B. The increase in cases of whooping-cough was mainly confined to the Midlands; the largest local rise was Warwickshire 35 and the largest fall was Lancashire 36. The most notable increase in the notifications of measles was Durham 166, and 54 further cases appeared in Montgomery, Llanfyllin R.D., where 21 and 24 cases were reported in the preceding two weeks. The only return of any size for cases of dysentery was London 18 (Lewisham 9). Notifications of paratyphoid continue to reflect the outbreak in Sheffield C.B.

In *Scotland* an increased incidence was recorded for scarlet fever 54, acute primary pneumonia 37, and diphtheria 9. A decline was reported for measles 38 and dysentery 16. The largest increases in cases of scarlet fever were Glasgow 17, Dundee 11, and Aberdeen 9. A rise of 15 in the notifications of diphtheria occurred in Glasgow.

In *Eire* the chief variations in the trends of infectious diseases were increases in scarlet fever 19 and whooping-cough 13 and a fall in diarrhoea and enteritis 11.

In *Northern Ireland* the returns showed little variation from those of the preceding week. A further decline was recorded in the outbreak of typhoid in Armagh U.D., where 6 cases were notified as compared with 15 and 25 in the preceding two weeks.

Week Ending November 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,187, whooping-cough 1,549, diphtheria 274, measles 3,374, acute pneumonia 485, cerebrospinal fever 40, dysentery 69, acute poliomyelitis 25, paratyphoid 66, typhoid 6.

No. 43

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Oct. 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1946					1945 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	28	1	18	1	—	35	3	20	3	—
Deaths		1	—				—	1		
Diphtheria	314	16	92	36	12	576	46	185	60	26
Deaths	3	—	1		—	9	—	1	—	—
Dysentery	59	18	32	—	—	247	43	66	2	—
Deaths					—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	1	—	—
Deaths		—					1			
Erysipelas			32	1	2			52	10	—
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				52					65	
Deaths	36	4	12		2	63	7	19	21	6
Measles*	2,884	105	162	69	7	422	47	71	46	3
Deaths	2	—	1		—	1	—	—	—	—
Ophthalmia neonatorum	68	5	20	2	—	49	5	14	—	—
Deaths										
Paratyphoid fever	89	1	—	—	1 (B)	5	—	2 (B)	—	—
Deaths	—	—	—		—	—	—	—	—	—
Pneumonia, influenzal	436	32	6	1	3	547	54	3	5	1
Deaths (from influenza)†	13	1	2		1	16	4	4	—	—
Pneumonia, primary			190	17				162	20	
Deaths		22			13		29		10	2
Polio-encephalitis, acute	2	—				5	—			
Deaths		—					—			
Poliomyelitis, acute	31	3	5	8	1	27	2	2	5	—
Deaths		—					—			
Puerperal fever		4	19		—		3	18		—
Deaths										
Puerperal pyrexia‡	160	11	10	2	2	113	8	19	2	3
Deaths		1					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,209	103	262	43	40	1,754	145	353	24	43
Deaths	—	—	—		—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Typhoid fever	9	1	2	2	12	12	2	—	3	—
Deaths	1	1	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—				—	—
Whooping-cough*	1,499	94	143	37	40	1,029	56	75	23	3
Deaths	4	—	—		—	1	1	—	1	2
Deaths (0–1 year)	391	45	59		18	318	42	48	32	12
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,157	604	591		123	4,223	673	557	171	115
Annual death rate (per 1,000 persons living)			13·0					12·6	11·0	
Live births	8,883	1403	1097		248	5,913	814	826	343	233
Annual rate per 1,000 persons living			22·1					16·5	22·1	
Stillbirths	265	26	26			169	18	33		
Rate per 1,000 total births (including stillborn)			23					38		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

Owing to a fire at the printers in Dublin it is not possible to publish the return of births and deaths in Eire for the week ended October 26.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology, Westcent, London.* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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ANY QUESTIONS?

Treatment of Polycythaemia

Q.—*What is the most recent treatment for polycythaemia? Is there any permanent cure?*

A.—To reply to the second half of this question first: there is no permanent cure for polycythaemia.

The condition is accompanied by an increase in the viscosity of the blood as well as by a raised blood volume. It is uncertain to which of these the symptoms are to be attributed, but the aim of treatment is to reduce both. Venesection is probably the most commonly used method. Phenylhydrazine serves the same purpose by destruction of red blood cells, but it requires careful administration or a severe haemolytic anaemia may result. Radiotherapy is a third method which aims at inhibiting erythropoiesis. The most satisfactory results have been obtained by irradiating the whole body at a distance of 2 to 2.5 metres from the tube; 30 to 50 *r* are given daily, and treatment is stopped when the leucocytes fall to 4,000 per c.mm. After a latent period of one to two months the red cell count starts to fall, and a prolonged remission, sometimes of two years, is obtained. (Pierson and Smith, *Amer. J. Roentgen.*, 1940, **43**, 577.)

More recently radioactive phosphorus has been employed. This isotope, P^{32}, is concentrated in the bone marrow, where it emits beta-rays and thus inhibits haemopoiesis; it has a half-life of 14.3 days. The average dose is 5 to 10 millicuries, given intravenously as an isotonic solution of sodium dihydrogen isotopic phosphate. Remissions of over two years have been produced. (Erf and Lawrence, *Ann. intern. Med.*, 1941, **15**, 276; *Blood*, 1946, **1**, 202.)

High Flying for Whooping-cough

Q.—*Is the treatment of whooping-cough by high-altitude flight of any value?*

A.—A high-altitude flight can have no effect on whooping-cough from the point of view of its treatment as a specific infection. The occurrence of focal areas of lung collapse, which is a serious complication of the disease, *might* be mitigated by the effect of altitude. The return of the child to normal heights would, however, permit their recurrence, so that any relief would probably be temporary. See also an annotation on this subject in the *Journal* of Dec. 26, 1942 (p. 758).

Plantar Warts and Fungous Infection

Q.—*Could you tell me the preventive treatment for (1) plantar warts, and (2) fungous infections contracted in swimming-pools and baths?*

A.—Plantar warts are caused by a virus from a patient with warts entering the epidermis of the sole, probably through a small abrasion. Epidemics in communities such as schools can be prevented by the following measures: (1) Removal of carriers. All feet should be examined at weekly intervals; any child with a plantar wart should be banned from barefoot exercise, bathing, etc., until cured. He should be provided with a special bath-mat. The incubation period of warts may be many months, so that the inspection must be continued for six months after an epidemic has apparently ceased. (2) Children with warts on other parts of the body should also be treated. (3) In the event of an epidemic, barefoot exercise should be stopped and slippers should be worn in changing-rooms. (4) The insides of all shoes should be examined for nails, etc., which might damage the skin of the sole. The arrest of an epidemic of warts by the removal of a carrier is described by McLaughlin and Edington (*Lancet*, 1937, **2**, 685).

The only satisfactory way of avoiding the risk of fungous infections at swimming-pools is to wear bathing-shoes. It is improbable that paddling the feet for a few minutes in hypochlorite or other antiseptic solution does more than satisfy the local health authorities. Rubbing in Whitfield's ointment before bathing is more effective but rather messy and carries some risk of dermatitis. In the event of an epidemic, careful search should be made for carriers. These should be intensively treated and provided with their own bath-mats and forbidden to walk about barefoot. The transmission of infection was the subject of a questionary to American dermatologists (*J. invest. Derm.*, 1940, **3**, 523). Opinions varied from those who said precautions were unnecessary to those who even swabbed the bath out with carbolic acid.

Haemospermia

Q.—*In young men what are the causes of haemospermia other than malignant disease, chronic granulomata, and venereal disease?*

A.—Haemospermia in young men is not at all uncommon and may be compared with epistaxis. It is probably due to congestion of the parts and possibly rupture of a small blood vessel; it seems probable that the bleeding may also occur in the neighbourhood of the verumontanum during a period of sexual stimulation. Another cause to be borne in mind is prostato-vesiculitis, especially when due to tuberculous infection. Few textbooks on surgery even mention the condition: see Romanis and Mitchiner, *Science and Practice of Surgery*, J. and A. Churchill, Ltd., 1941, **2**, 960.

Wilson's Disease and Rh Incompatibility

Q.—*Kernicterus and certain types of infantile cirrhosis have been shown to be late results of Rh incompatibility between mother and child. Has Wilson's disease any connexion with the development of maternal Rh antibodies?*

A.—The answer to this question is not yet known with certainty. No large series of cases of Wilson's disease has been published with details of the blood groups. Juvenile hepatic cirrhosis and kernicterus may both result from iso-immunization of the mother due to Rh incompatibility, but, while it is an attractive speculation which has occurred to many workers on Rh problems that Wilson's disease (hepato-lenticular degeneration) might have a similar aetiology, there is no proof in favour of this hypothesis and the available evidence is against it. Wiener and Brody (*Science*, 1946, **103**, 570) have reported three cases of Wilson's disease in which they failed to detect evidence of iso-immunization of pregnancy, and they give it as their opinion that this is not the origin of Wilson's disease.

Carey Coombs Murmur

Q.—*Is the Carey Coombs murmur in acute rheumatism due to accentuation of the normal third heart sound? Is it definitely indicative of a subsequent mitral stenosis or organic mitral disease? How long after this murmur does the diastolic murmur of mitral stenosis arise? Does myocardial failure often develop in rheumatic hearts which show no evidence of valvular disease?*

A.—The Carey Coombs murmur is a soft, short mitral diastolic murmur which appears during the course of active rheumatic carditis and which cannot be attributed to mitral stenosis. Carey Coombs thought it was due to stiffening of the mitral cusps, and commented on its development in the later stages of active carditis and on its persistence. Bland, White, and Jones (*Amer. Heart. J.*, 1935, **10**, 995), however, reported on its not infrequent disappearance as the patient recovered from the acute attack, and presented necropsy evidence indicating that it was very doubtful if the murmur could have been attributed to mitral valvulitis—the macro-

scopic lesions were sometimes trivial They thought that it might depend upon left ventricular dilatation.

This murmur is not an accentuated third heart sound, although Carey Coombs stresses its frequent association with such an accentuation. Nor is it theoretically "definitely indicative" of subsequent mitral stenosis or organic mitral disease; but in practice it usually is so, not only because Carey Coombs's explanation may still be correct in many cases, but also because its occurrence denotes an attack of rheumatic carditis of some severity from which the mitral valve is unlikely to escape.

The diastolic murmur of mitral stenosis is said to take two to five years to develop after the attack which first caused mitral valvulitis. Mitral stenosis rarely arises without a preceding mitral systolic murmur, but may do so. Heart failure very rarely, if ever, develops in a case of rheumatic heart disease showing no evidence of a valvular lesion.

Preparing for Lactation

Q.—*Is the use of stilboestrol ointment advisable in preparing the nipples for lactation?*

A.—It is very difficult to say whether any particular ointment or other remedy is of real value in the preparation of the nipples for lactation. Claims are made for many substances, but these are rarely based on controlled observations. Stilboestrol ointment has been tried out in some centres, but has been more often used for the treatment of cracked nipples during the puerperium than the preparation of the nipples during pregnancy. Since one of its actions is to promote the growth of epithelium its use for the former purpose appears more rational.

There would be no harm in the inquirer carrying out a clinical trial, but it should be borne in mind that, even though the results appear to be good, it will have to be shown that the effect is due to the ointment itself, or rather its stilboestrol content, and not to the massage incidental to its application. Nowadays there is a widespread scepticism as to the value of any of the special preparations advised for the nipples during pregnancy, and the tendency is to advise no treatment other than the regular washing away of dried crusts of secretion from the mouths of the ducts, and gentle manipulation to ensure that the nipple stands well out from the surrounding skin.

Vitamin E in Angina Pectoris

Q.—*In an American weekly it is reported that a Canadian doctor has had great success in the treatment of angina with large doses of vitamin E. Is this report accurate?*

A.—Vogelsang and E. V. Shute (*Nature*, 1946, **1**, 772), studying the effect of high-dosage vitamin E (α-tocopherol acetate) on purpura,[1] noted the good influence of this factor upon coronary heart disease. "A study of a series of cardiac patients, carried out with the help of Mr. Floyd Skelton and Dr. Wilfrid Shute, suggests (*a*) vitamin E in large dosage (200 to 600 mg. 'ephynal' Hoffman-LaRoche) has no apparent effect on normal hearts, even after administration for many months on end; (*b*) its effect upon patients having congestive heart disease and the anginal syndrome is marked; it increases exercise tolerance and diminishes or abolishes anginal pain during the period of its administration; its diuretic effect[2] is pronounced. The effect of vitamin E upon coronary pain may be produced by a direct action on the coronary vessels or by influencing the metabolism of the heart muscle. The first possibility is suggested by an older observation[3] on the effect of vitamin E in dilating the local capillaries in senile vulvitis. Work on the purpuras raises another possibility, too. Small haemorrhages into the walls of the coronaries[4] or into the heart muscle itself may produce such pain. It is now clear that such extravasations may be either prevented or reabsorbed by means of vitamin E. When vitamin E was given in large doses over long periods of time some patients complained of cardiac irregularities. These were relieved by reducing the medication to low levels."

The successful treatment of angina pectoris with large doses of vitamin E awaits further confirmation. There is not much more available evidence on the point, but Bruger (*Proc. Soc. exp. Biol.*, N.Y., 1945, **59**, 56) seemed to show that this vitamin increased the deposition of cholesterol in the aorta of cholesterol-fed rabbits. Until there is much more evidence indicating benefit from the use of vitamin E in angina pectoris, such treatment is not advised.

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2 Shute, E. V. (1945). *Canad. med. Ass. J.*, **52**.
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4 Paterson, J. C. (1941). *Canad. med. Ass. J.*, **44**.

Pseudo-reaction in Schick Testing

Q.—*The usual explanation of a pseudo-reaction in the Schick test is given as "sensitivity to bacterial protein." How does this bacterial protein get into the toxin filtrate? Is the protein not more likely to come from the growth medium?*

A.—The pseudo-reaction in the Schick test is an allergic reaction, the incidence of which increases with increasing age of the tested community. It is almost certainly a reaction to the diphtheria toxin rather than to the breakdown products of the whole organism, although of course there will be small amounts of bacterial protein in the toxin filtrate. Comparative tests have shown that the pseudo-reaction which is elicited by the injection of Schick toxin corresponds to the Moloney test, which follows the intradermal injection of diluted toxoid, usually 0.2 ml. of a 1/200 dilution. In such a dilution the toxoid is the only foreign protein likely to be present in any appreciable amount, and will therefore be responsible for any reaction elicited. This allergic phase seems to occur when the individual is in the transition stage between susceptibility and immunity to diphtheria, and those giving the reaction probably do not need to be artificially immunized. The suggestion that the allergic reaction is due to proteins in the culture medium is negatived by the virtual absence of allergic reactions among troops immunized with tetanus toxoid. The few cases of allergic reaction that have been reported following injections of tetanus toxoid were apparently associated with the protein of a particular peptone that was used early in the production of the toxoid.

Chemoprophylaxis of Respiratory Infections

Q.—*I have read recently that in the U.S. Army sulphathiazole was given as a prophylactic against the secondary infections associated with respiratory diseases and that a reduction in incidence resulted. Is this correct?*

A.—During the war large-scale trials in the control of respiratory infections by the use of small doses of sulphadiazine (not sulphathiazole) were undertaken in American training units. Very often the main contributor to respiratory infections in these Army camps was streptococcal pharyngitis, and sulphadiazine in doses of 1 g. daily seemed to cut short outbreaks of streptococcal infection, while the incidence of other less well defined respiratory infections was in some instances also reduced. However, an unfortunate sequel was that certain epidemic strains of haemolytic streptococcus became sulphonamide-resistant, and in subsequent years outbreaks of infection due to these drug-fast strains caused a lot of trouble. In this country the use of small doses of sulphonamide to prevent secondary infections after measles or influenza has been advocated, but again there is the risk of inducing drug resistance in the secondary bacterial invader, which is usually the haemolytic streptococcus. It is perhaps wiser to withhold sulphonamides until there is some indication of a secondary bacterial infection—for example, otitis media—and then to treat the infection at this early stage with therapeutic doses of the drug. The risk of reactions from small prophylactic doses is slight, and rheumatic patients have taken doses of 1 to 2 g. of sulphanilamide for many months on end without toxic effects. Sulphathiazole is more likely than sulphanilamide or sulphadiazine to produce toxic or allergic reactions.

For discussion on the chemoprophylaxis of bacterial infections see the *M.R.C. War Memorandum No. 10*, 2nd edit., London, 1945, and refer also to a leading article in the *Journal* of Jan. 13, 1945 (p. 50).

INCOME TAX

Board and Lodging of Locumtenent

N. F. asks "What amount per week can be claimed as a professional expense in respect of board and lodging of locum, living at my house?"

*** The only sound basis is a proportion of the total expense of running the private, as distinct from the professional, portion of the house, together of course with the cost of food, etc. Such expenses vary so much between practices that it is impossible to offer any guidance as to an actual weekly amount.

Service in India

Z. X. was on service in India from 1943 to 1946. In 1944–5 he was married and had one child. He has an income of £227 arising from securities in this country.

*** If Z. X. can claim to have been a "resident" in this country although personally absent (e.g., if he maintained his wife in a residence here) he can claim the full allowances against the income from securities, as the Indian pay is outside the scope of the United Kingdom tax. If he cannot claim as a "resident," he is entitled to claim in respect of a proportion only of the normal allowances, the proportion being determined by the ratio of the income from securities to the Indian earnings. In reply to a further question we are not aware of any book now available on income tax for medical practitioners and we advise Z. X. to consult his local inspector of taxes, preferably by appointment.

Amount Payable

N. M. E. quotes amounts of income and asks what tax will be payable for 1943–4, 1944–5, and 1945–6.

*** Assuming that the whole amount of the life insurance payments are allowable the tax apparently due on the basis of the particulars given are: 1943–4, £103; 1944–5, £115; and 1945–6, £130.

Assistant's Car Transactions

A. C. is an assistant in a country practice. When he joined the R.A.M.C. in 1940 he sold his car for £7; he has just bought another car for £405. His principal proposes to make him a car allowance of £50 a year.

*** For the year 1946–7 A. C. should claim an "initial allowance" of 20% of £405=£81, and "depreciation allowance" for the half year to April, 1947, of 25% of £405, i.e., 1/2 of £101=£51, £132 in all. He must of course set against this any sums he receives by way of car allowances, but can deduct the running costs, including licence, insurance, etc. Some adjustments may be required if the car is used for private purposes as well as for work as assistant. No advice can be given with regard to the amount of the car allowance paid by the principal; that is a matter for settlement between the two parties, taking into account the ordinary remuneration.

P. Q. has been acting as an assistant in general practice for three years and has received a car allowance from her employer of £50 a year. She bought a car in 1939 for £130 and sold it on July 9, 1946, for £320, buying another car for £*x*. She has had little or no wear-and-tear allowance on the old car. What claim can she make for 1946–7?

*** She is entitled to base the *gross* claim on (a) "initial allowance," 20% of £*x*, (b) "wear-and-tear allowance"—i.e., 25% of £*x* per annum—i.e., three-quarters of 25% of £*x* for 1946–7, and (c) running costs, including licence, insurance, repairs, petrol, etc. From the total of these amounts must be deducted a "balancing charge" in respect of the old car, £320−£130=£190 and the £50 car allowance. The difference will be claimable as an expense of carrying out the duties of the assistantship, subject, perhaps, to some further reduction for the private use of the car if it is so used.

Car Transaction—Cost of Maid

K. M. (a) started work as an assistant (with no car allowance) on Oct. 10, 1946, having bought a car in September, 1946; (b) he has to live at the surgery and to employ a maid for dealing with callers and the telephone; otherwise the maid would not be necessary. What can he claim?

*** (a) An "initial allowance" of 20% of £300=£60, and a wear-and-tear allowance of 25% of £300 per annum—i.e., say, half of £75—i.e., £37. Total, £60 plus £37=£97. In addition he can, of course, claim the running expenses, licence, etc. If the car is used for private purposes some restriction of the total costs and allowances will probably be claimed by the Revenue. (b) A claim for a proportionate part of the cost of the maid will be allowed, on the basis of an estimate of the time spent on the "professional" part of her work to the total.

LETTERS, NOTES, ETC.

Artificial Limbs for Women

Mr. C. R. HOWARD writes: Regarding the points in the design of the modern artificial limb raised by your correspondent, "L.S.S.W." (Sept. 21, p. 438). (1) The lack of security in movement of abduction is either due to incorrect use of the limb or lack of confidence, as a patient with a ten-inch stump should be able to achieve this without undue effort providing body weight is taken on sound limb. (2) Ability to dance on an artificial limb is purely a matter of confidence. The number of people that can do this bear out the statement, and it does not depend on any particular type of suspension or limb. (3) The triangular shape of bucket was adopted especially for the fleshy type of stump, to remodel stump and prevent rotation. (4) Making an artificial limb to pair with the sound limb is a complex problem, since the sound limb changes shape with the use of the muscles, also there have to be allowances for inclusion of mechanical joints. (5) The symmetrical shape of the knee is necessary because of the rigid materials used. Any variation from a circle allows a gap between the edge of shin and the knee, which is a trap for clothing, and can not only cause damage to clothing, but any clothing getting caught up can throw the person backwards and easily cause an accident. (6) Regarding adjustability to various shoe-heel heights, one has to know limbs to consider this point and know the mechanical disadvantages which operate with all types of limbs. Also, one of the most necessary improvements required in artificial limbs is that of raising the centre of gravity, to give a limb that can be used with less muscular effort. Therefore, any extra gadget or additional weight in the region of the foot and ankle is contraindicated. (7) The most justified criticism of the present limb is the glitter of the enamel. This is one point that should be, and could be, overcome in a comparatively easy manner, by using matt finish enamel or matt rubber surface, which would also have the advantage of deadening mechanical noise.

Effects of Penicillin Lozenges

Dr. A. D. BELILIOS (Wimbledon) writes: Within the last month I have had two cases of gingivitis following the use of penicillin lozenges in children. Each case was precisely similar. Both were mild cases of tonsilliitis with pyrexia. I prescribed mist. acetylsal. and penicillin lozenges. Within two or three days both children were normal so far as the tonsillitis was concerned, but their gums became alarmingly swollen and fleshy, and bled easily. I assumed at the time that I was dealing with a streptococcal gingivitis and ordered a penicillin paint made up with magnesium hydroxide. This was used every three hours, and the penicillin lozenges continued. Both cases cleared up on this treatment in about five days.

Dr. E. J. BRADLEY (Margate) writes: I recently had penicillin treatment by inhalation: first 800,000 units spread over ten days; then 1,000,000 units concentrated into five days. On both occasions soreness, dryness, and cracking of the lips and nostrils were produced. The tongue also became sore and tender, but no actual ulcer appeared. There was considerably more irritation while using penicillin made by one firm than with that made by another; and incidentally there is a marked difference in the smell of the two brands.

Herpes and Varicella

Dr. GEORGE ARMOUR writes from Woodhall Spa: I submit the following unusual clinical case of herpes associated with chicken-pox in two contacts in a remote, isolated Lincolnshire farmstead. Mrs. X developed herpetic vesicles on the right anal margin with a few slight scattered lesions on the right buttock (corresponding to the distribution of the right inferior haemorrhoidal nerve) on Oct. 7, 1946. On Oct. 23 her son aged 32 developed widely distributed chicken-pox, and on the following day her other son aged 23 developed an even more widely distributed similar rash. The house is very remote and completely isolated, and being harvest-time none of the occupants had left the purlieu of the farm and no contact had been possible except through occasional tradesmen. On careful inquiry no case of chicken-pox could be traced within a radius of fifteen miles. The period of incubation appears most significant.

Missing Medical Books

Mr. A. J. JOHNSTON-WILSON has written from the Department of Printed Books, British Museum, W.C.1, with reference to the severe losses suffered by the British Museum from enemy action. The section containing medical books was the one most seriously affected. The losses include both foreign and English works and are particularly serious among books published in the late part of the last century and the early part of this century. Mr. Johnston-Wilson would gladly inform any member who has books which he is willing to give to the British Museum whether they are among the losses and particularly required. One of the publications wanted is *Historic Notes on Canadian Medical Lore*, being lecture memoranda published in Toronto in 1906.